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THE FRUIT MAGAZINE

SCIENTIFIC FARMER AND CANADIAN CITIZEN

PUBLISHED MONTHLY IN THE INTERESTS OF GROWERS, DEALERS AND CONSUMERS

Volume IV OCTOBER, 1911 Number 1

NOTICE

This page indicates what the front cover of this Magazine will be in the future. We have been repeatedly requested by subscribers, who appreciate the superiority of this publication, to add general farm features, in order to serve the entire rural population of Canada to the best advantage, in addition to the general reader. We shall continue to maintain the same high standard of mechanical and literary excellence as heretofore, while largely extending our field of usefulness as a first-class national publication, with a just claim to a place in every home.

The "Fruit Magazine, Scientific Farmer and Canadian Citizen" will be national in scope and world-wide in its sympathy and influence The price will be 15 cents a copy or $1.50 a year, but up to December 31, 1911, we will accept advance subscriptions for one year from our friends in the United States and Canada at the old price of $1.00. Here is a chance for circulation solicitors to reap a harvest for the remainder of this year, and for the public to get the most valuable magazine ever offered for the money. Agents write for terms, quick!

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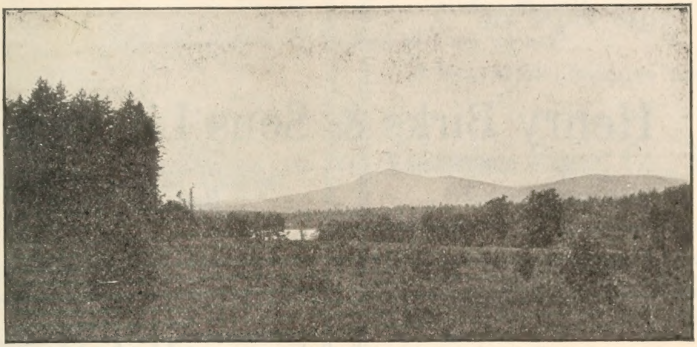

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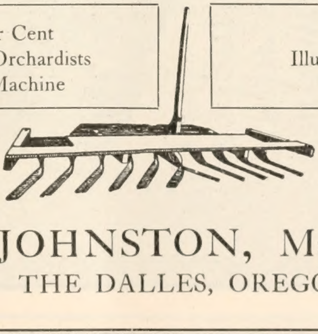

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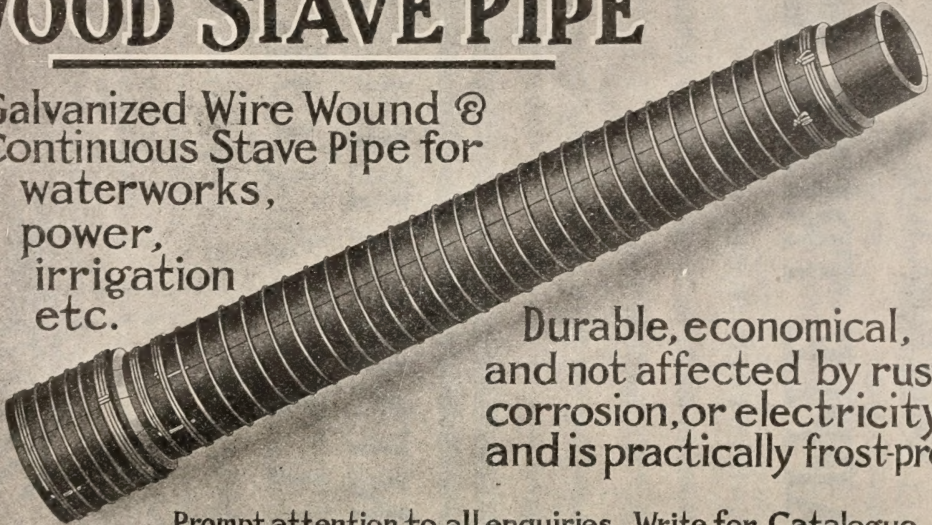

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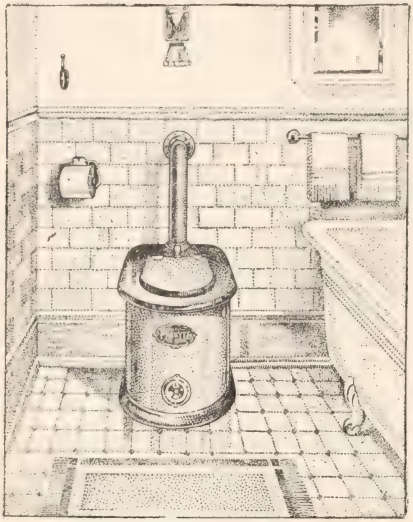

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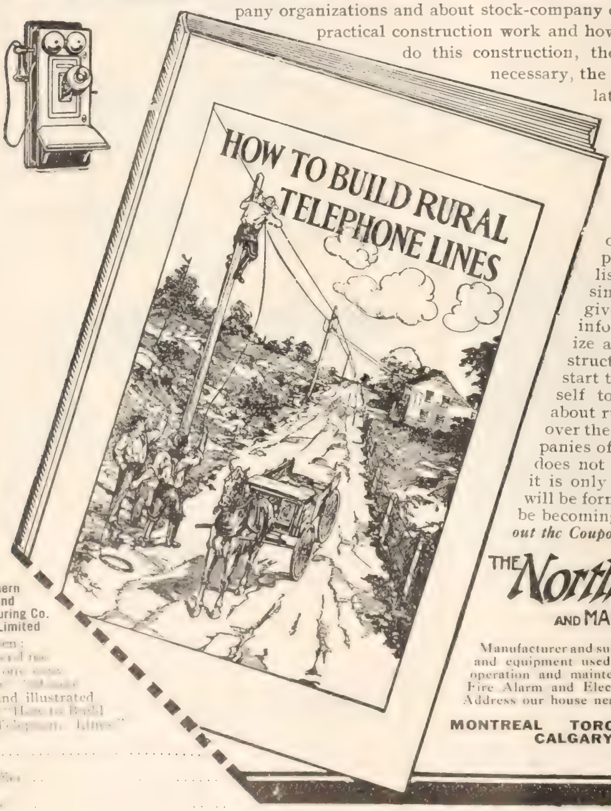
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You can't fell trees without some chips,
You can't achieve without some slips;
Unless you try you'll wonder why
Good Fortune seems to pass you by.
Success is not for those who quail,
She gives her most to those who fail
And then with courage twice as great
Take issue once again with Fate.
'Tis better far to risk a fall
Than not to make attempt at all.

The Fruit Magazine
Scientific Farmer and Canadian Citizen

VOL. IV OCTOBER, 1911 No. 1

Pumping for Irrigation in British Columbia

By PROF. B. A. ETCHEVERRY

DURING this summer and last summer it has been my privilege to visit several of the irrigated districts of British Columbia, and I have observed with interest the character of your water supplies and their relation to irrigation.

The irrigable land is situated as separate small valleys formed on both sides of creeks, or in benches high above your splendid large rivers. While there is an abundance of water in these rivers, such as the Thompson, the Fraser, the Kettle Valley, and in your large lakes of the dry belt, these sources of supply, although adjacent to irrigable lands, are practically not available for gravity irrigation, because of the considerable height of the main benches of land above these bodies of water, and the very flat grades of the river which make the diversion directly from these sources an economical impossibility.

For these reasons it has been necessary to utilize the creeks. These creeks have a very irregular flow. The supply is abundant during the beginning of the irrigation season, but in many cases diminishes to an insufficient flow before the close of the season. In most of the watersheds of the streams storage reserves can be constructed at a moderate cost, and will help to regulate the flow.

Up to the present the natural stream flow, in some cases, supplemented with storage water, has been the usual source of supply. Naturally, the most easily constructed systems were installed first, and the best available sources have been taken up. With the increasing demand for water to put new land under irrigation, less favorable sources of water must be utilized, and the cost of development will become greater. There will still remain bodies of land for which no gravity water is available, and which may be situated not too far above a lake or river. For these conditions, that is, where the cost of development of gravity water is excessive, or where there is no gravity water available, and where the conditions for pumping are favorable, the cost of pumped water may compare favorably with that of gravity water.

For these reasons I have chosen this subject for my paper, which, while it may not be of interest to all those here, will, I hope, be of value to representatives of British Columbia.

In the installation of a pumping plant the factors to be considered are: the size and type of the pump and engine, the kind of fuel, the cost of installation, and the total annual cost of operation. It is not my purpose to go into the details of the design of a pumping plant, but to take up a few of the fundamental points which should be considered before installing a plant.

The discharge capacity of the pump will depend on the area irrigated, the duty of water or depth of water required on the land, and the period of operation. On some lands a total depth of 12 inches of water during the irrigation season will be ample for young orchards. For a full bearing orchard not over 18 inches should be sufficient, while for alfalfa and other forage crops 24 to 36 should be ample. To put a depth of 2 feet of water on one acre it takes a flow of very nearly 1 cubic foot per second for 24 hours; this is equivalent to 450 U. S. gallons per minute for 24 hours. This relation can be applied to any case to obtain the size of the pump. For example, if it is desired to irrigate a 40-acre orchard, 2 feet deep, in an irrigation season of 120 days, this requires 80 acre feet in 120 days, or two-thirds of an acre foot per day; this will be obtained from a pump giving one-third of a cubic foot per second, or 150 gallons per minute, when the pump is operated continuously. There are, however, many disadvantages to operating a pump continuously, especially for a small tract:

1st. Continuous operation requires either continuous irrigation or the construction of a regulating reservoir.

2nd. A small plant is less efficient, and requires a proportionately larger fuel consumption than a large plant.

3rd. It is often more difficult to irrigate with a small stream than with a larger one.

For these reasons it is seldom that it is desirable to have a small pumping plant operated continuously; usually it is preferable to make the period of operation half or one-third of the irrigation season, and use a pump two or three times the size required for continuous irrigation. By combining with a neighbor it may be possible to have the use of the pump in rotation, and operate it continuously. The size of the engine depends on the size of the pump, the kind of pump, and the lift. It is therefore affected by the factors on which the size of the pump depends. The disadvantage of not operating continuously is that the first cost of installation is greater, and that where electric power is available it may not be possible to obit it at a meter rate, but at so much a horse-power per season, in which case it is desirable to use a small-size plant, making the period of operation as long as possible. But where the charge for electric power is based on the quantity actually used, or when a gasoline engine is used, it is preferable to shorten the period of operation, especially for small tracts.

The type of pump to be used depends on the discharge required and the height of lift. Deep well pumps and air lift pumps are used for pumping from deep wells, and for the present need not be considered in British Columbia. Hydraulic rams are used for small quantities of water, such as for domestic purposes or small farms. They require a nearby stream with sufficient fall in a short distance.

For pumping water from lakes or streams the two most common types of pumps are the centrifugal pump and the plunger pump. Simple centrifugal pumps are best adapted to discharges above 200 gallons per minute and for lifts under 75 feet; compound centrifugal pumps may be used for lifts of 200 feet or more. Plunger pumps are best adapted for high lifts above 100 feet. The efficiency of a commercial centrifugal pump when installed often falls below the manufacturer's guarantee, and a properly installed centrifugal pumping plant is usually about 50 per cent. The efficiency of a high-class plunger pump when properly installed is about 90 per cent.

The engines may be either gasoline or steam engines or electric motors. When electric power can be obtained at a reasonable cost, even though it be a little higher than the fuel cost of either gasoline or steam, it is preferable, because of the lower cost of operation and maintenance.

For small plants, and where the fuel cost of gasoline is not much in excess of the fuel cost of steam, a gasoline engine is preferable. Steam engines require the services of a licensed engineer, and his salary alone for a small plant irrigating 10 to 40 acres may be the largest item of cost. Steam engines are preferable where coal is cheap and for large plants. It can also be used to advantage where several small pumping plants are to be installed not far from each other. In this case the steam engine is used to generate electric power at a central station, and the power is transmitted to the electric motors operating the individual pumping plants. In any case, after all the above facts have been considered, the selection must be made on the basis of cost.

The cost of a pumping plant includes, in addition to the manufacturer's price of engine, pump and accessories, the foundation, the building to house the plant, and the labor of installation. A completely erected centrifugal pumping plant, either steam or gasoline, should not exceed $100 per horse-power for a 10 horse-power engine; $75 per horse-power for a 20 horse-power, and $60 per horse-power for a 50 horse-power plant. An electric plant should be erected for two-thirds of the above costs.

Annual Cost of Pumping.—The annual cost of pumping includes fuel cost, cost of attendance, and fixed charges.

Fuel Cost.—From a large number of tests on pumping plants in Southern California, it has been found that the efficiency of a well installed commercial centrifugal pumping plant will usually not exceed 50 per cent. when allowing for friction in pipe, valves, etc. Where plunger pumps are used the plant efficiency may be as high as 90 per cent.

To raise 1 acre foot of water 1 foot high, assuming a 50 per cent. plant efficiency will take two kilowatt hours, or about one-third of a gallon of engine distillate, or 13 lbs. of coal. Based on these figures, and assuming the following costs, electricity 3c a kilowatt hour, coal $6 a ton, engine distillate 22c a gallon, the fuel cost for one acre foot of water lifted one foot high is 6c for electric power, 7 1-3c for gasoline, 4c for steam engine.

Attendance.—An electric motor requires a minimum of attendance; small gasoline plants require little attention, but are not always reliable; steam engines require a licensed engineer. For small plants the cost of attendance for an electric motor should not exceed 5c per hour, for a gasoline engine 10c per hour, and for a steam engine 40c per hour. The cost of repairs will not exceed 1½ per cent. of the cost of the plant for a gasoline or steam plant; 1 per cent. for an electric plant.

Fixed Charges.—The fixed charges, assuming 6 per cent. for interest on money invested, 12 per cent. for depreciation of a steam or gasoline plant, and 10 per cent. for depreciation of electric plant, will give a total of 18 per cent. for the gasoline or steam pumping plant and 16 per cent. for the electric motor pumping plant. By assembling the above items of cost a fair estimate may be obtained of the cost of installation and the annual cost of pumping. For example, if it is proposed to pump 100 feet high to irrigate a 40-acre tract 6 inches deep each month for four months, by operating the pump one-third of the time, it would require a 40 horse-power pumping plant, which would cost not over $2,000, or about $50 an acre. The annual cost of pumping per acre at the prices assumed above would be for the gasoline plant, $14.66 for fuel, $2.40 for attendance, 75c for repairs, $9 for fixed charges; or a total of $26.80. For an electric motor the items are $12 for power, $1.20 for attendance, 50c for repairs, and $8 for fixed charges; or a total of $21.70 per acre. For the steam engine plant the total cost would be $27.35.

From the above example it is seen that the fuel cost is only about 50 per cent. or less of the total cost. For lower lifts the proportion of fuel cost to total cost would be less; while for higher lifts the proportion would be greater, and it would be economy to use a more efficient plunger pump, although the first cost of installation may be greater.

The first cost of installation and fixed charges could be made lower by using a smaller plant and operating continuously, but this would be partly balanced by increased cost of attendance and increased fuel consumption.

The above estimated cost of about $25

an acre for the annual cost of pumping 2 acre feet of water 100 feet high, or about 12c for an acre foot lifted 1 foot high, is a fair estimate for plants under somewhat similar conditions. This cost of water may seem high as compared with gravity water, but to obtain an idea of the feasibility of developing water by pumping, comparisons must be made with the value of irrigation water in the irrigated districts of British Columbia, and also in other similar districts. In British Columbia, up to the present, water obtainable by gravity without pumping has been plentiful. For that reason pumping has not been necessary, and very few pumping plants have been constructed. However, water is becoming more scarce and valuable, and the steps which many irrigation companies in British Columbia and Washington are taking to conserve water and prevent all losses by carrying it in canals lined with concrete and in pipes constructed at a great expense, show that water has become sufficiently valuable to justify pumping.

Making a comparison first with water thus obtained, we find that the cost of construction of a well-constructed system will go up to $50 or $60 an acre and even higher. The Treton project in eastern Washington, constructed by the United States Reclamation Service, cost $93 per acre. The Umatilla project in eastern Oregon, also constructed by the Reclamation Service, cost $60 per acre. Other systems installed or being installed in British Columbia will cost over $60 per acre. The big advantage of gravity systems is that the annual cost of operation is small, usually less than $5 per acre, but if to this the interest on the cost of construction and the depreciation be added, the total annual cost of gravity water may be over $10 per acre.

A more interesting and valuable comparison is obtained by considering pumping plants in other districts. In eastern Washington water is now being pumped through lifts of 250 feet. In the citrus districts in California lifts above 200 feet are not unusual, and it is considered profitable to pump 400 feet. The cost of pumping water in the Panona district of South California will average $15 per acre for one acre foot delivered by irrigation companies, while for smaller private plants the cost is often far greater. In 1905 the United States Department of Agriculture made tests which show that the cost of pumping at private plants of 10 to 100 horsepower, with lifts 100 to 300 feet, varied from $10 to $90 per acre of water, 12 inches deep. Of course, there is a limit beyond which it is not economically feasible. In the California citrus districts lifts above 400 feet have been profitable; for the orchard lands of British Columbia equally high lifts should be profitable, for the net return per acre from a good apple orchard is usually more than that from a citrus orchard. A citrus orchard 10 years old should give a profit of $100 to $150 per acre. The net profits from apple orchards 10 to 12 years old in the Yakima Valley are given in U. S. government bulletins as $200 to $600 per acre.

With profits larger than those obtained from citrus orchards in Southern California, what has been considered feasible in pumping there is much more so for the apple orchards of British Columbia, when no other more economical source of supply is available.

HEARD AFTER ELECTIONS

"How much are these chickens?" asked the lady in the market.

"I sell them at one dollar each," said the market man.

"Do you raise them yourself?"

"Oh, yes. They were seventy-five cents yesterday."

PUTTING IT PRETTILY

There is a good deal in putting a thing nicely. A prisoner was being sentenced at the assizes the other day. "You have a pleasant home and a bright fireside, with happy children sitting around it, haven't you?" asked the judge.

"Yes, sir," said the prisoner, who thought he saw a way out of the difficulty.

"Well," said the judge, "if the happy children sit around the cheerful fireside until you return they will stay there just forty-two days."

Cold Storage and Precooling of Fruits

By Mr. F. E. JONES, New Westminster, B.C.

THE process of precooling was first used by H. G. Powell, in the Bureau of Plant Industry Investigations in Georgia, in 1904. Since that time the investigations have been continued and extended, and precooling is now being used in many sections.

Before taking up the systems of precooling, its advantages and disadvantages, I wish to present something of the history of the transportation of citrus fruits in California, because it is there that the greatest study and development have taken place. Moreover, I want to show the part the railroads have played in the development of the present systems of transporting fruit, and of the service they have and are rendering the fruit-growers, in spite of charges by the public and enormous freight rates, etc.

Early in 1888 ventilated refrigerator cars were introduced into California for carrying citrus fruits both under ventilation and refrigeration. This marked an epoch in the transportation of fruits in the United States, and was heralded as a wonderful economic discovery. Twenty years ago only the very hardiest of California fruits might be shipped as far as Salt Lake City, but the introduction of the ice-packed, air-tight car has been responsible for the development of an output which in 1908 reached about 66,000 cars, valued at about 75 million dollars.

The first cars in service on the Santa Fe were known as the Tiffiny patent, having a capacity of about 4,000 lbs. of ice. Ventilation was secured through small ventilators in the ends of the cars. At the end of the second season thereafter the Santa Fe put into operation the Wicks patent refrigerator car, which had been found by test to be a better refrigerator and ventilator than the Tiffiny. These cars were 34 feet in length. After using them and finding that they were better in service, shippers over the Santa Fe declined to load any other cars, and the road was forced to take out of service 250 Tiffiny cars and rebuild them. But they had no more than got them rebuilt when this car was discarded for still newer devices. All kinds of refrigerator cars were coming into service, improvements continued in ventilating and refrigerating devices for refrigerator cars. This has continued until today there are over 400 patents taken out for refrigerator cars in this country alone. The construction of the cars has advanced, particularly as to strength, height and length.

By the beginning of the season of 1896 the Wickes car was out of date compared with others, and the Santa Fe was obliged, in order to satisfy the demand of the shippers and to be on an equality with competing roads, to discard it. Arrangements were made with the Santa Fe Fruit and Refrigerator Line, the Continental Fruit Express and the Fruit-growers' Express to supply the line with sufficient of the latest improved refrigerator cars. These car lines were not satisfactory to the shippers, and in 1901 the Santa Fe line purchased all the modern cars of the Santa Fe Fruit and Refrigerator Line and built a sufficient number of modern 40 ft. refrigerator cars to take care of the traffic.

This equipment has been steadily improved upon and increased, so that today the Santa Fe has 6,000 of the later improved refrigerator cars operated by the Santa Fe Refrigerator Despatch. This equipment cost over six million dollars, and is sufficient to take care of the maximum citrus fruit loading to any part of the season. This immense investment has been made primarily for the citrus fruit traffic, as there is not sufficient perishable fruit on other parts of the system to employ any such number of cars during the dull season in California.

Thus we see that the railroads have played an important part in the development of the transportation of citrus fruits; have expended enormous sums of money to perfect the best interests of the citrus growers. True, no doubt, that they have realized good interest on the amounts invested, or expect to, but the service rendered to the growers, and the perfection of the present methods, are none the less commendable. There are points worthy of careful consideration, and which are especially important to the producer:

1. Cold storage lengthens the season of marketing a product.

2. Cold storage increases the territory over which a perishable product may be marketed.

Both of these points are all-important to the producer, especially to the producers on the Pacific coast. The local demand for fruit on the coast is very small in comparison with the quantities produced, thus markets must be found at a distance. Moreover, the quantities produced are fast becoming more than the various markets can consume during the normal season of the product. If all the apples produced had to go into immediate consumption on account of there being no means of holding them for a longer period of distribution, it can be readily seen that the markets would be overstocked with apples, and the prices would be far below the cost of production. There would be tremendously large quantities for a comparatively short time, and then a great scarcity.

By means of cold storage we are able to regulate this condition, giving a steady supply of fruit, and at prices reasonable to both consumer and producer. Were cold storage facilities withdrawn from the apple industry, the result would be disastrous to the grower—storage facilities have made this fruit one of the staple foods. By means of refrigeration we have been able to introduce our fruit into distant markets, and so to regulate the supply that a fairly uniform distribution can be made.

These conditions are pointed out to show that the cold storage house has practically become a necessity to the apple industry. Its advantages are still greater when we realize the vast amounts of other foodstuffs, whose range of consumption is increased. The cold storage house must be considered the ally of the producer and the shipper.

RESULTS OF INVESTIGATIONS OF BUREAU OF PLANT INDUSTRY

For the past eight years the above bureau has carried on investigations of the cold storage of fruits. During this time some important facts and principles have been developed. So far practically no work has been done in the Pacific northwest, but the same principles are applicable.

It has been found that the condition of the product at the time it is stored has a most important influence on the behavior of the fruit in storage, and the length of time it may be held in good condition. This has reference to:

1. Regions where the fruit is produced.

2. Stage of maturity of fruit at the time it is picked.

3. Care in picking, handling and packing.

4. Promptness with which the fruit has been placed in storage and cooled.

5. Precooling.

All these factors are under the control of the producer, the packer, or the shipper, and will be taken up in the order named.

INFLUENCE OF THE PLACE OF PRODUCTION

Investigations of the department show that the region producing the variety of fruit has a large influence on its behavior in storage. A great many varieties have been studied, and these have been obtained from different districts of the United States. It has been found that the place and the conditions of production have a material influence on the keeping qualities of the different varieties. Differences of from one to three months in the length of time a variety may be held in good condition have been found to be due to the influence of different places of production.

INFLUENCE OF METHODS OF CULTURE

The methods of culture and care are factors affecting the keeping qualities of the fruit. The quantity of tillage the trees are given, the pruning, the age of the trees, and the climatic conditions may be the governing factors in the behavior of fruit in storage. Large, coarse and sappy fruits produced by young trees do not have as good keeping quality as the same variety grown on older trees.

It has been found, especially under eastern conditions, that trees with thick heads and branches, which prevent the fruits from maturing uniformly, may yield a large proportion of green, poorly colored fruits, which do not hold well in storage. Opening up the trees, in this case, in order to give more light and air will materially influence the length of the cold storage period or season of the product.

In irrigated sections the moisture conditions are under the control of the grower. If he irrigates and stimulates growth at a time when the fruit is maturing, he will have brought about conditions which result in the production of sappy, poorly colored fruit of low keeping quality.

Any condition of soil, climate or orchard treatment which results in the production of abnormal fruits may be governing factors in their cold storage behavior. If these factors were taken more into consideration, much loss would be avoided.

Fruit is a living organism, which has a definite time in which to carry on its life functions. As long as these life functions are active the fruit remains in a vital condition and is fit for food. After the life processes have become weakened and exhausted death of the fruit takes place, rapid deterioration results, and the fruit is unfit for food. When the fruit is severed from the tree the life processes are hastened, while the fruit remains at a relatively high temperature, and unless some means is taken to control or to reduce these processes the death of the fruit ensues within a comparatively short time. When the fruit is stored at a low temperature the vital processes are very materially retarded; they do not entirely cease, but continue slowly, the rate depending on the character of the fruit and the temperature at which it is held. It follows that when the life processes are reduced the fruit will remain in good condition a greater length of time. This is the principle upon which the cold storage of food products is based.

This low temperature also retards the growth and development of various forms of decay and rot, due to fungi, which grow upon the fruits and destroy them. Most of these fungi cannot germinate at the low storage temperature (32 degrees F.), but when once started they continue slowly to develop, and may entirely destroy the fruit in the storage rooms. The most common forms of decay are dependent wholly upon the kind of handling, as it has been shown by the Department of Agriculture that these forms of decay are due to fungi which have not the power to penetrate the unbroken, sound skin of a healthy, normal fruit. The decay starts at some injury to the skin, usually a break, scratch, heavy bruise, tear, some mechanical abrasion made in picking, grading or packing. Worm holes, insect bites or punctures from the branches allow the decay to gain entrance.

Under orchard treatment and conditions we ought to consider spraying for the control of insects and fungus diseases. If this work is not thorough much of the fruit may have worm holes, or be injured so that it ought to be discarded entirely. Any insect or disease which interferes with the normal vitality of the trees likewise affects the quality of the fruit. This is a well-known fact to up-to-date orchardists, but the effect on the storage quality is not so well appreciated.

SEASONAL INFLUENCES

It is a well-known fact that during unfavorable seasons the quality as well as the quantity of fruit may be affected. For example, after destructive frosts the fruit may be thinned so that the remaining fruits are overgrown and sappy, and consequently of low keeping quality in cold storage. Fruit having been produced under unfavorable seasonal conditions should be carefully watched, so that it may be sold before it has deteriorated to a great extent.

PROPER STAGE OF MATURITY FOR STORAGE FRUIT

G. Harold Powell, in his article on "The Relation of Cold Storage to Commercial Apple Culture," says: "The ideal apple for keeping in cold storage is fully grown and highly colored, but still hard when picked from the tree." When the investigation by the Government was begun the common practice was to pick the fruit intended for storage before it was fully matured. A systematic study on a large scale has shown this to be erroneous. Green, immature fruit is subject to scald, and if very green will shrivel in storage, while the same variety fully matured holds much longer and in better condition. This has been found to hold true for all fruits except pears and lemons.

INFLUENCE OF HANDLING ON THE KEEPING QUALITY

The Bureau of Investigations have shown that a direct relation exists between the type of handling and the occurrence of decay in both storage and transit. As before stated, fungi gain entrance to fruit through some form of mechanical injury to the fruit. Most of this injury occurs in preparing it for market, in the picking, grading, hauling and packing operations. Growers who really think that they are very careful about the handling of their fruit are injuring a large percentage through ignorance and oversight. It takes but a small abrasion of the skin to allow the entrance of fungi, and it is impossible to use too much care in the handling of fruit. By using great care in handling the orange and lemon in California, the losses from ordinary decay, which formerly averaged fully five per cent. in these fruits, have been wholly avoided.

On page 24 of the Bureau of Plant Industry Bulletin, No. 123, "The Decay of Oranges while in Transit from California," Mr. Powell says: "In 1905 the average amount of mechanically injured fruit, based upon a careful inspection of more than 40,000 oranges during January and February, was 17 per cent. On February 27, 1905, a circular was issued calling attention to this injury and its relation to decay, and suggesting methods whereby it could be reduced. Apparently the growers were quick to adopt ways of reducing the injury, for after the 1st of March it did not exceed 7.5 per cent.—an immediate reduction of nearly 10 per cent. In the packing houses it was an exception to find a grader who could see and throw out an orange showing a slight mechanical injury. It is probable that 95 per cent. of the fruit injured in handling is included in the packed fruit."

The apple, pear, peach, plum, cherry and grape are far more easily injured than the orange or lemon. Yet the growers of these two fruits have found it necessary to entirely revolutionize their handling methods, and they use gloves in picking, grading and packing operations. In the citrus investigations sand, gravel, dried twigs and dirt in the picking bags and field boxes were responsible for a great deal of the abrasion of the skin. The skin of apples and pears is even more susceptible to this sort of injury. In grapes the commonest injury occurs at the pedicel, and injury at that point is easily done unless care is used in handling the bunches both in picking and packing. Lift and handle the bunches only by the main stems. Great care in handling is the foundation upon which rests the successful marketing of fruits over wide distances.

INFLUENCE OF PROMPT COOLING

In the Year Book for 1903 Mr. Powell says: "A large proportion of the difficulties in the cold storage of apples is the result of delaying the storage of the fruit after it is picked. The apple ripens more rapidly when it is picked than it does when hanging on the tree and maturing in the same temperature. The diseases with which the fruit is affected appear to develop more quickly when storage is delayed."

Mr. A. B. Stubenrauch, Department of Agriculture, Washington, D. C., states: "The Bureau of Plant Industry investigations have demonstrated that apples placed in storage and cooled promptly hold in good condition from one to three months longer than the same varieties delayed ten days or two weeks if the temperature is rather high." This would be of the utmost importance with varieties like the Jonathan, which ripens early in the season when the weather is warm.

The cooling of fruits for ordinary shipments is very important, temperature records showing that it requires several days for the fruit to reach a point where ripening and decay will be arrested, when ice alone is depended upon to cool the fruit and to hold it cool. It follows that if the cooling can be done more promptly and quickly than the ice of the car alone will accomplish, the fruit will carry farther and in better condition.

To this system of prompt cooling the term "precooling" has been applied.

I will now take up the subject of "Precooling of Fruits," both as a continuance of the above discussion and as an article which may be used by itself.

References.—Bureau of Plant Industry Bulletin No. 123; Year Book for 1903; reprint of nearly the same article as Year Book for 1903; "Precooling of Fruit," by Prof. O'Gara; "Practical Cold Storage," by Cooper.

DEVELOPMENT OF THE COLD STORAGE WAREHOUSE BUSINESS

During the past twenty years the commercial fruit business has developed a system of warehouses cooled by mechanical methods of refrigeration. These warehouses are sometimes operated as independent fruit storage plants, but more often the storage of the fruit is a department of a general cold storage warehouse business. The storage of apples in mechanically cooled houses has developed largely since 1890, though there has been a gradual evolution in ice-making and in the application of ice to the preservation of fruits and vegetables, from the simple methods of the ancients in India, who produced ice by the evaporation of water exposed to the night air in shallow, porous vessels, to the highly developed ice-making machines that cool the warehouses of the present day. Warehouses for the cold storage of fruit have been constructed in nearly every large city and in many smaller towns in the apple belts. California was probably the first state in which active experiments were carried on by the Department of Agriculture, under its Bureau of Plant Industry, along the lines of cold storage of fruits, and with especial reference to refrigeration in transit. From the work done in California under this bureau by G. H. Powell we get most of the statistics of the value of the precooling system and its comparative merits. Aside from the work of the Government along these lines there has developed a very extensive cold storage warehouse business. This is a business just as separate as the growing of the fruit itself.

THE RESPONSIBILITY AND DUTY OF THE COLD STORAGE WAREHOUSEMAN

The cold storage warehouse should be kept at a uniform temperature of the desired degree of cold during the storage season. It is expected to be managed in other respects, so that the deterioration of the fruit and losses from any other cause may not be reasonably attributed to a poor construction or installation of the plant, to its negligent or improper management, or to ill-treatment of the goods within the warehouse. The warehouse treatment is not supposed to insure the fruit against the natural deterioration that may take place in cool temperatures. The warehouseman is only a trustee of the fruit stored, and is bound to exercise only that degree of care and diligence in the management of the building and its contents that a man of ordinary care and prudence would exercise under the circumstances in protecting the plant and goods as if they were his own property.

THE UTILITY OF THE COLD STORAGE PLANT

It has been widely asserted that the cold storage plant is largely responsible for the increased cost of living, as by taking advantage of cold storage facilities a few corporations or individuals are supposed to be able to buy up and to some extent "corner" food necessities, holding them in storage, and thereby controlling the prices and marketing. This may be true in many instances, and perhaps ought to be controlled legally, but no regulation by law has yet been brought up that has not had the tendency to defeat its own object, which is, or should be, the prevention of the sale of unwholesome food. Too many keep their ears open to the unfavorable side only, and forget that there is a favorable side.

HISTORICAL DATA ON PRECOOLING

The first precooling of oranges was done at the plant of the Los Angeles Ice and Cold Storage Company, Los Angeles, California, in the spring of 1905. At that time several carloads of fruit were cooled to 35-40 degrees F. in the warehouse for the Bureau of Plant Industry, and through the co-operation of this company about 10 loaded cars were cooled by forcing cold air from a coil room in the cold storage house through ducts which led to the car and back to the coil room. The cold air could be forced in either direction through the cars.

In 1906 a 3-ton ice machine was installed by a commercial company in a packing house at Arlington, California, from which cold air was forced through a loaded car and back over a series of ammonia coils, and so on continuously around the circuit. The plant was built on the so-called intermittent vacuum principle, the object being to reduce the atmospheric pressure in the car frequently by a fan, thereby drawing the warm air out of the packages, to be replaced by the cold air when the cold current was again turned on. The capacity of this plant was too small for the purpose of a practical demonstration of its value.

In the spring of 1907 the Government, in co-operation with the Los Angeles Ice and Cold Storage Company, erected an experimental precooling plant for the purpose of making accurate tests of the cooling of oranges in cars by forcing cold air through the cars. This plant consisted of two 30 in. square insulated ducts leading from an ammonia coil room capable of supplying from 16 to 20 tons of refrigeration in 24 hours. With a motor and a fan the cold air was forced in either direction through the car and back again to the coil room. The temperature of the air was varied from 20 degrees F. when first entering the car to higher temperatures. It was forced through the car at different velocities and in volume varying from 4,500 to 6,000 cubic feet a minute.

During the summer of 1907 an experimental precooling plant was erected by interests connected with the Santa Fe at San Bernardino, Cal., and another plant at Roseville, Cal., by interests connected with the Southern Pacific Company.

The plant at Roseville, twenty miles north of Sacramento, at the junction of the Ogden and Shasta routes, making use of the intermittent vacuum system, was built by the Pacific Fruit Express and the Southern Pacific at a cost of more than a million dollars. This enormous amount was expended in erecting a plant that could have no practical demonstration until it was completed. The first test was made on October 9, 1909, with a train of refrigerator cars loaded with ripe grapes brought from Lodi and loaded into the cooling sheds. Ten cars were cooled simultaneously. In two hours the temperature within the cars fell to 38 degrees. The cars were then dispatched to New York, with a delay of less than three hours. There was no ripening and no decay after the cars left Roseville, and ten days later this fruit was exposed in the markets of the Atlantic cities in precisely the same condition that it left California.

THE ENORMOUS PRECOOLING PLANT OF THE SANTA FE

The new combined ice-making and precooling plant of the Santa Fe at San Bernardino, built under the supervision of Mr. Gray, is of reinforced concrete and something over a quarter of a mile in length. The ice-making capacity of this company is 250 tons per day, with a combined storage capacity of 30,000 tons. The power plant is equipped with three 320 horse-power Stirling boilers and two cross compound duplex Vilter refrigerating machines, each of 300 tons capacity. The ammonium condensing system is with a double pipe type over a concrete reservoir 80 feet square and 10 feet deep. A water supply of about 500 gallons per minute is furnished from artesian wells whose flow is accelerated by air lift to the required amount. A large dry storage 120x142 feet gives a capacity of 900 tons of ice.

The winter ice storage is divided into four rooms of something over 7,000 tons storage capacity for each room. The precooling equipment extends from the end of the winter storage, and is equipped for handling 32 refrigerator cars at a setting. The main air ducts of the precooling are of concrete and form the support of the car icing platform.

The air is cooled by galvanized brine pipes located at a coil chamber at the end of the winter storage. The brine used is taken from the ice tanks by electrically-driven pumps, sent through its refrigerating circuit and returned through a 200-ton double pipe brine cooler which, together with the circulating pumps, is located beneath the dry storage. A double-deck tunnel or passageway of reinforced concrete extends through the winter storage from the precooling to the dry storage, where the tunnel continues as a single tunnel beneath the dry storage to the double pipe cooling room.

All the ice is handled by a direct conveyor passing from the dry storage and through the upper section of the tunnel through the winter storage, where it may be diverted to the storage rooms or carried on to the car icing docks as required. The lower compartment of the tunnel is used for the brine mains running to the winter storage and the precooler coil chamber.

The device for the cooling of the air is the most interesting in the mammoth plant. The coils are equal to 175,000 lineal feet, or more than enough to run from San Bernardino to Los Angeles and back. Over these the air is driven and cooled. Of the two large tunnels one is tapped by a pipe, which conveys the cooled air at the rate of 17.00 cubic inches per minute into the cars. The other tunnel conveys the air from the cars back to the coils. Eight fans almost 8 feet in diameter are used to force the air, one set driving it into the outgoing duct and the other set drawing it from the cars. By means of flexible couplings the 20 in. mains are connected at both ends of the cars. The amount of air which can be circulated through the cars is about 8,000 cubic feet per minute, running at full capacity with 32 cars connected at once. After the first connection is made and the warm air or gas which may be in the car is removed by allowing one end of the car to remain open for a few minutes, for the first hour the air is driven in at one end of the car and taken out at the other, then the entrance and exit of air are reversed, so that when the process is finished each box of oranges and each orange in the box has equal temperature. The maximum time for cooling the cars is four hours.

This gives the big plant a precooling capacity of 32 cars every five hours.

Since the California Fruit-growers' Exchange, which controls about 70 per cent. of the citrus output of the state, notified the railroads on April 13, 1910, not under any consideration to precool any of its fruit until the decision of the Interstate Commerce Commission was handed down, the big precooling plants of the California refrigerator car lines have not had an opportunity to even begin to test their capacity; but, nevertheless, the railroads, for the benefit of the industry, have spent years of service and a vast amount of money to perfect the transportation of California fruits to eastern markets.

SYSTEMS OF PRECOOLING

There are two systems of precooling:

1. Precooling in storage rooms before the fruit is loaded.
2. Precooling by blowing cold air through the loaded cars.

The first system can be done only by growers, shippers, or by associations of growers or shippers. While the system requires one extra handling of the packages, it has some advantages over the car precooling system, which can be done only on a large scale. And as it involves the handling, movement and delay of loaded cars, it is only practical of successful accomplishment by transportation companies.

Much work yet remains to be done before it can be definitely decided which system is best for all concerned. From the standpoint of the effect on the condition of the fruit, the preloading cold storage system is advantageous, in that the cooling can be done promptly, thoroughly and uniformly. With the car-cooling system more or less delay is inevitable in assembling the cars at central points where the precooling plants must necessarily be located. If this delay is considerable in warm weather it may practically nullify the benefits to be derived. Another disadvantage is the difficulty of uniformly cooling the load. So far it has been found practically impossible to distribute the air blast so that it will reach every part of the car uniformly, unless the methods of loading are materially changed. Some packages of the load are reduced to the danger point of freezing before others have been sufficiently cooled. The general practice is to cool as low as possible and to depend upon an equalization throughout the load to bring the temperature down to the desired point. In this way the extra cooling done on some packages is expected to reduce the temperature of those not sufficiently cooled. There is ground for believing this unequal cooling may be injurious to the fruit, especially to such classes of highly perishable fruits as grapes and perhaps berries.

The advantages of the car-cooling system are that it requires no extra handling of the packages, and it relieves the grower or shipper of the responsibility of doing the work. These two methods are being thoroughly investigated by the Government, and the work will be continued until some definite conclusions are drawn.

The investigations so far have shown that precooling, when promptly and efficiently done, has to a marked degree influenced the carrying and holding qualities of the fruit intended for ordinary shipment or for storage. Under the present conditions the deciduous fruits are picked very green and immature, in order to avoid the softening and ripening which take place before the fruit is cooled. When precooled these fruits can be allowed to remain on the trees from three to five days longer, and thus have a chance to acquire a much higher quality.

Do not get the idea that precooling prevents decay, for it does not; it retards it. Precooling will not enable all the poor and low-grade fruits which have broken down to be shipped and made as good as new; some people actually have that idea. Precooling performs no such miracle; it simply offers a method by which we can immediately reduce the temperature of the fruit to a point where the processes of decay are at a minimum. That in itself will mean millions of dollars to the fruit-growers of the northwest if taken advantage of and used wisely.

THINKING SOME

The small boy stood in front of the dazzling lights of the cheap theatre with a yellow dog under his arm. Evidently he wanted to get in, and the sight of a well-dressed and apparently prosperous man on the steps gave him an idea.

"Are you the manager of the show?" asked the boy. It turned out that he had guessed correctly, and the lad continued:

"I want to see the show, but I have not got the money. I'll give you this dog if you'll let me in?"

The manager's heart melted. He remembered that he, too, had been a boy.

"You may go in," he said, "but never mind about giving me the dog. Take the dog along with you."

The lad went in with the yellow dog under his coat. After the performance the manager was still standing in front, and happened to see the urchin come out.

"Well, sonny," he remarked, "how did you like the show?"

"Oh, pretty well," he said, "but I'm glad I didn't have to give you the dog."

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Doctor: "Now, there is a very simple remedy for this—er—this—er—recurring thirst. Whenever you feel that you want a whisky and soda, just eat an apple—eat an apple."

Patient: "But—er—fancy eating fifty or sixty apples a day!"

Fruit-preserving Recipes

Contributed to *The Fruit Magazine* by Mr. HARRY BEACH

APPLE MARMALADE

TAKE 3 lbs. apples, 2 ozs. candied peel, 1 lemon, 4 lbs. sugar, 1 pint water. Peel, core; slice the apples very thinly; put into a pan with the water, lemon juice and rind; cook slowly until the apples are soft, take out the lemon rind, add sugar and chopped peel, boil until thick. The peel must be chopped very fine.

APPLE CHUTNEY

Take 4 lbs. of apples, 3 lbs. of tomatoes, 2 lbs. of onions, 1 lb. of brown sugar, 6 ozs. of stoned raisins, 4 ozs. of sultanas, 4 ozs. of almonds, ½ oz. of whole ginger, 1 tablespoonful of salt, 3 pints of vinegar, and 2 dozen chillies. Shred the almonds, chop the raisins, onions and chillies, slice the apples, and cut the tomatoes small. Put all the ingredients in a large pan, stand it on the stove; let it boil for five minutes, then simmer for seven hours. Bottle it, and cork tightly or cover with paraffin wax. This can be used at once, but it is better if kept for a week or two.

CLOVE APPLES FOR COLD MEATS

Take 3¼ lbs. sugar, 2 cupfuls of water, and boil to a syrup. Drop in quarter of apples, pared, and when they are cooked lift out carefully with a fork. When all the fruit has been cooked drop some of the skins in the syrup with 1 doz. cloves. Cook about 20 minutes, remove the skins, but pour the syrup with the cloves over the apples in a jar, and cover up. This is inexpensive, and beats all kinds of chutney.

PRESERVED PEARS

Pears for preserving should be firm. Take, say, 12 Bartlett pears, peel, core and cut in halves (quarter if large). Take 2½ lbs. of sugar, the thin rind and juice of 3 lemons, and about 3 pints of water. Put in a preserving pan and boil for about 20 minutes, removing any scum; then put in the pears and boil till tender. Take up the pears carefully and put into sealer jars, previously warmed; then if the syrup seems thin and watery boil it up quickly for a few minutes and pour over the pears, covering them. The addition of the lemons brings out the true flavor of the pears. A few cloves added to the syrup is preferred by many instead of lemons.

LEMON MARMALADE

Take 12 good lemons, wash well, cut in quarters, and slice the skin very thinly; remove seeds, and cut up the pulp roughly, and put all together in the preserving pan with 6 or 7 quarts of water, and let this soak for 12 hours or more; then boil this all gently together for 2 hours. Weigh the mixture, and for each pound take an equal weight of sugar and boil till clear and beginning to set, when it must be potted and tied down whilst still hot.

ORANGE MARMALADE

Take 9 oranges and 6 lemons and prepare the same as for lemon marmalade, using less sugar if sweet. California oranges are used.

STORING APPLES AND PEARS

The gathering and storing of apples and pears are very important matters. These fruits, both for dessert and cooking purposes, are very valuable, and as their keeping in a sound condition for a long time depends to a great extent on the way in which they are gathered and stored, much attention must be given to them. Do not bruise the fruits, but place each one carefully in shallow baskets, and with equal care put them in single layers on dry shelves in cool, dry, well-ventilated rooms. The pears should be put in the warmest part and the apples in the coolest. Fallen specimens must be placed by themselves and not with the sound ones.

The Irish Schoolmaster

"Come here, my boy; hould up your head,
And look like a jintle-man, sir;
Just tell me who King David was?
Now, tell me, if you can, sir."
"King David was a mighty man,
And he was King of Spain, sir;
His eldest daughter, Jessie, was
'The Flower of Dunblane, sir.'"

"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Sir Isaac Newton—who was he?
Now, tell me, if you can, sir."
"Sir Isaac Newton was the boy
That climbed the apple tree, sir;
He then fell down and broke his crown,
And lost his gravity, sir."

"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Just tell me who old Marmion was?
Now, tell me, if you can, sir."
"Old Marmion was a soldier bold,
But he went all to pot, sir;
He was hanged upon the gallows-tree
For killing Sir Walter Scott, sir."

"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Just tell me who that Moses was?
Now, tell me, if you can, sir."
"Shure, Moses was the Christian name
Of good King Pharaoh's daughter;
She was a milkmaid, and she took
A profit from the water."

"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Just tell me, now, where Dublin is?
Now, tell me if you can, sir."
"Och! Dublin is a town in Cork,
And built upon the equator;
It's close to Mount Vesuvius,
And watered by the 'cratur.'"

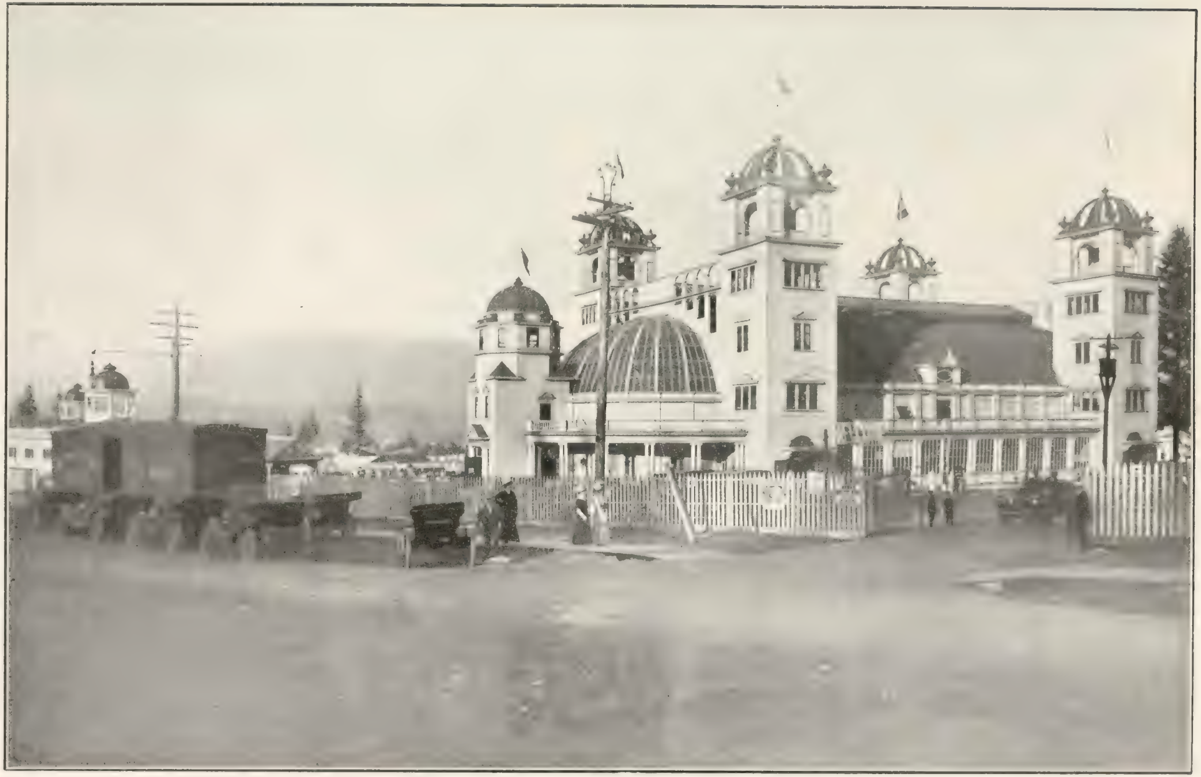
"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Just tell me, now, where London is?
Now, tell me, if you can, sir."
"Och! London is a town in Spain;
'Twas lost in the earthquake, sir;
The Cockneys murther the English
Whenever they do spake, sir."

"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Just tell me who Sir Rob Roy was?
Now, tell me, if you can, sir."
"Sir Rob Roy was a tailor to
The King of the Cannibal Islands;
He spoiled a pair of breeches, and
Was banished to the Highlands."

"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Then, Bonaparte—who was he?
Now, tell me, if you can sir."
"Old Bonaparte was the king of France
Before the Revolution;
But he was kill't at Waterloo,
Which ruined his constitution."

"You're right, my boy; hould up your head,
And look like a jintle-man, sir;
Just tell me who King Jonah was?
Now, tell me, if you can, sir."
"King Jonah was the strongest man
That ever wore a crown, sir;
For though the whale did swallow him,
It couldn't keep him down, sir."

"You're right, my boy; hould up your head,
You're now a jintle-man, sir;
For in history and geography,
I've taught you all I can, sir.
And if anyone should ask you how—
Where you got all your knowledge, sir,
Just tell them 'twas from Paddy Blake
Of Bally Blarney College."



INDUSTRIAL BUILDING, VANCOUVER EXHIBITION

Editorial

THE PEOPLE'S WILL

PERHAPS no more striking illustration of the strength of democracy in the Dominion of Canada was ever manifested than the defeat of Sir Wilfrid Laurier on September 21 by the people who love and honor him. Although one of the foremost statesmen of the world today, a true patriot and a man who has devoted his life, with signal success, in an honest endeavor to promote the welfare of his country, he made a mistake, and the people expressed their disapproval by turning Sir Wilfrid and his government out of office. The pronouncement of the people was so emphatic that no doubt remains that there exists a strong, healthy, national sentiment in this country, and that in the face of a real or supposed menace to our fiscal independence the masses of the people throw party affiliations to the winds and vote for what they believe to be in their country's best interests.

The people may make mistakes, but they may be trusted to rectify them in due course.

We have not one word to retract from our editorials on the reciprocity agreement in the March, April and July numbers of this magazine. We have contended that this question never should have been dragged into the sphere of party politics, and Sir Wilfrid made a mistake when he risked the existence of his government on a question which he should have referred to the country in the form of a plebiscite.

If there are any considerable number of people in the United States (there are none in Canada) who hoped to make reciprocity a stepping-stone toward annexation, we are glad that this young nation has given them a lesson which they should remember. There can be no doubt that the tremendous majority rolled up against reciprocity by the Canadian voters was largely attributable

REAR OF GRANDSTAND, VANCOUVER EXHIBITION

PARTIAL VIEW OF VANCOUVER EXHIBITION GROUNDS

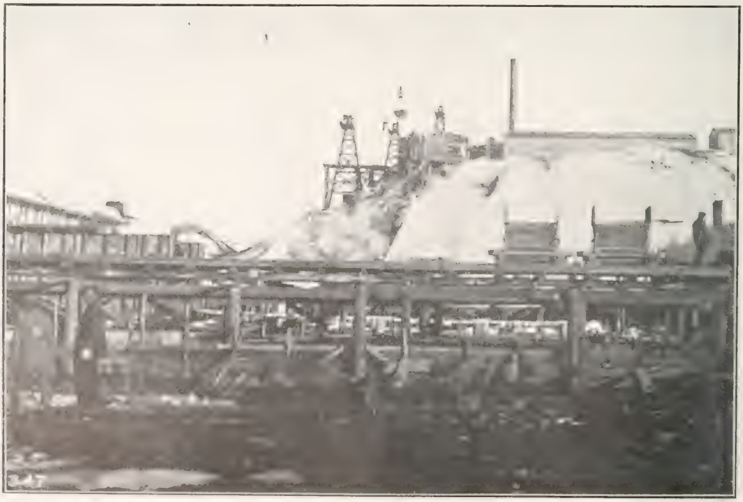
to President Taft's ill-advised remarks about "the parting of the ways," Representative Bennett's idiotic action in introducing a resolution at Washington asking for "Canadian annexation negotiations with Great Britain," and Speaker Champ Clark's impertinent presumption in expressing the belief that reciprocity would eventually result in the American (United States) flag floating "over every foot of British North America."

As intimated in our March number, Mr. Clark may take credit to himself for having slain a multitude of conscientious supporters of reciprocity with the "moist jawbone of an ass." But the real power behind the defeat of the reciprocity pact and the consequent overthrow of the Laurier administration was the protected interests in both countries, who have been enriching themselves for so many years out of the pockets of the consuming public.

No doubt the sun is fast setting on the day of high tariffs between modern civilized nations, and the fight of the masses against monopolies and trusts must be continued irrespective of political parties. No fear need be entertained that the new Government at Ottawa will plunge into a policy of increasing the national tariff wall. No party dare pursue a course that would be quickly resented by the Canadian people, and we may look for some very careful, well-considered legislation for the next few years. In 1894 the Canadian Government, recognizing some of the weaknesses of the national policy, began to prune the high protection tree in an effort to stop the flow of our youth and enterprise into the United States. But hard times had come in "old Canada" and the Government of the day had failed to make known to our own people the possibilities of our great West land, with its wealth of natural resources and opportunities. The result was that the people decided that it was "time for a change" in 1896, and a new star arose to guide Eastern Canadians to the promised land of the Golden West, where the beacon lights of progress and development were quickly kindled to welcome back thousands of our best brain and brawn who had wandered south of the border, not knowing that they had left a better land than they had found. Since 1896 Canada's tariff wall has been materially lowered, a substantial preference has been granted to Great Britain, and the hands on the dial of progress must not be turned back or the flow of desirable immigrants into this country checked by any injudicious act on our part.

The farmers and fruit-growers of Canada should not be satisfied to rest on their oars with a home market only, but should continue to improve their methods, insist on substantial reductions of the duty on machinery and other materials which they require, so that they may be able to compete on equal terms in the markets of the world, because they must bear in mind that the consuming public will not continue to endure the continued increase of the cost of living. The wage-earner has to be considered, and no matter how high wages may be, a man's income is simply the difference between what he receives in salary and what it costs him to live and keep his family.

No party or government can afford to ignore the possibilities and the national aspirations of the dominating spirits of this country, or fail to put themselves in harmony with the native forces and ideals of this stalwart young Dominion, whose national heart is throbbing with the buoyancy of youth and whose pent-up energy and natural wealth afford a glorious opportunity for development along the lines of peaceful industrial expansion. Through the world-wide discussion of this reciprocity proposal Canada has received the greatest advertisement in her history, and, as we have invited white people here from many lands, let us extend the right hand of fellowship and bid them welcome to citizenship in the freest and most prosperous country in the world today—a nation whose development has been unique in the world's history, not brought forth through the agonizing travail of bloody wars, human strife and estrangement from the parent-kingdom, but a nation born in peace, nursed through her tender years on the paternal bosom of the Mother of Nations, and rocked in a cradle of freedom and liberty. The Canadian ship of state shall continue to ride proudly on over the international sea of trade and commerce to her natural destiny, and we may be trusted not to stul-



C. P. R. IRRIGATION WORKS, BASSANO, ALTA.

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tify ourselves by dishonoring the Motherland, to whom we are bound by an ennobling and inspiring sentiment which shall outlive the changing evolutions of commercial and political development:

"Dreams of the ages in thee find fruition;
Freemen rejoice as thy glories expand;
Beacon lights burning, hold true to thy
mission—
Canada, twentieth-century land."

* * *

FRUIT-PRESERVING RECIPES

WE wish to direct special attention to the series of fruit-preserving recipes now running in this magazine. These are contributed by Mr. Harry Beach, a man of wide experience and marked ability in the fruit-canning and preserving business, and we trust that the readers of *The Fruit Magazine, Scientific Farmer and Canadian Citizen* will take full advantage of this valuable information.

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VANCOUVER FAIR

THOSE who were apprehensive of the success of the Vancouver Annual Exhibition when it was first started two years ago had their fears dispelled last month, when success crowned the efforts of the management beyond their most sanguine expectations.

Coming so early in the season of course the fruit display could not be expected to assume very large proportions, but the floral exhibit was a most beautiful display, and all other departments were well represented. Much credit is due to the manager, Mr. H. S. Rolston, and his efficient staff of directors for the splendid success this year.

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OURSELVES

HERETOFORE *The Fruit Magazine, Scientific Farmer and Canadian Citizen* has been printed by contract, but in future this magazine will be turned out from our own presses.

We have installed in our new premises the best printing plant in Vancouver. Every machine in the place, from the big cylinder press down to the smallest pony job press, is absolutely new and up to date. We have the only "Premier" Whitlock press on the Pacific Coast, and are now prepared to turn out on short notice all kinds of book, catalogue, magazine and general commercial job printing, including the best color work possible. The art of modern printing will be developed to the highest degree of perfection in our shop that first-class machinery and the highest standard of skilled workmen can produce. Artistic colored labels will be one of our specialties and we guarantee absolute satisfaction to our patrons.

Our circulation now having reached most satisfactory proportions, the value of our advertising space has increased proportionately. But for the present our rates will not be increased, and for the next sixty days we shall continue to make yearly contracts at our old rates.

Controlling Soil Moisture

IT is generally thought that the necessity for irrigation in the United States exists only in the region west of the Mississippi River, but repeated crop failures in the East and successful farming in the West have called attention to the importance of controlling the moisture of soils rather than accepting the conditions as they exist. Professor Voorhees estimated the loss to the hay crop of New Jersey from the drought in May and early June of one year at $1,500,000, while small fruits and vegetables were even more seriously affected than the grasses. The records kept by him at the experiment station show that in years of abundant rainfall in April and May the yield of hay averaged 2.65 tons per acre. In another year it was but a fraction over one ton, owing to the deficiency of rainfall in April and May, at the low price of $10 a ton, a loss for the 25 acres of over $400. The yield of crimson clover forage in years of abundant rain was 8.5 tons per acre; in a drought the yield was but five tons, or in a good year the yield was 70 per cent. greater. The deficiency in the rainfall at the critical period was alone responsible for this difference in yield.

C. P. R. IRRIGATION CANAL, BASSANO, ALTA.

C. P. R. IRRIGATION WORKS, BASSANO, ALTA.

To show the frequency of severe droughts it is cited: "The rainfall records in Philadelphia from 1825 to 1895 (70 years) show that in 88 per cent. of the years there was a deficiency of over one inch for one month, or that in 62 years out of the 70 there was one month in the growing season from April to August in which such a marked deficiency occurred as to cause a serious shortage of crop, and that for the same period there were 39 years in which the deficiency extended throughout two months, while in 21 years it extended throughout three months, or in 30 per cent. of the years included in this period there were three months during the growing period in which the average rainfall was deficient one inch or more. It is thus observed that a wide series of crops would be likely to suffer in more than one-half of the years for which the record is available while a still larger number would suffer in nearly one-third of the years, for it must be remembered that even a slight deficiency in one month may result in serious reduction in yield and consequent loss if it occurs at a time when the crop is making its largest development."

Some Aspects of the Profession of Agriculture

By T. D. MITCHELL, Vancouver, B. C.

WHILE agriculture is the oldest pursuit in the world, it is only in comparatively recent times that it can be said to have attained the dignity of a profession. But at the present day to attain to the head of that profession requires probably a greater range of study and practice than is necessary in any other; and whereas the study of other professions is somewhat the same in any country and the practice largely universal, the practice of agriculture varies in every locality, and is governed by climate, soil, market conditions, etc. The profession as practised in Great Britain as a whole is, I think, more advanced than is general on the American continent, the cause being, as in many other cases, necessity. There a rotation of crops has long been necessary, root crops alternating with grain, hay and pasture for the proper fertilization of the ground and the eradication of weeds. In our own country we have now even more need for the intelligent study and practice of agriculture, and as Canadians are more migratory than formerly, a knowledge of principles that can be applied to most conditions should be attained, as well as those which can have only local application. A farmer today with a knowledge of chemistry, botany, entomology and other applied sciences has a much greater chance of commercial success than has his untutored neighbor (provided other qualifications are equal), and besides that the educated farmer will have a pleasure and profit that the other knows nothing of. In a new country makeshift ways have to be resorted to, but in Canada success is enabling the farmer to undertake up-to-date methods, as well as giving him more leisure, and more leisure and less grinding work is getting to be within the reach of increasing numbers. At the present time large tracts of land are being brought under cultivation by means of irrigation and also by the adoption of dry farming methods, and if to make a blade of grass grow where none grew before is a worthy object, is not to make two grow where only one grew before just as much so? Government experimental farms are doing good work in the way of testing new varieties of seeds, etc., and giving communities the benefit of their tests; but the farmer has to know something of the needs of his own particular farm to get the best results. One field may be lacking in lime, another in potash, and an application of nitrogen in one form or another might pay on all. This should not be determined by guesswork, and the farmer should be enough of a chemist or botanist to find out for himself. Where farmyard manure can be obtained in abundance artificial manures do not have to be resorted to so much,

RECEPTION OF WESTERN CANADA IRRIGATION CONVENTION DELEGATES BY THE CITY COUNCIL, BASSANO, ALTA., AUGUST 11, 1911

C. P. R. IRRIGATION WORKS, BASSANO, ALTA.

but sometimes, even when the ground is rich in plant food, it is essential to have a very rapid growth at some stage of the plant's life, as, for instance, where young turnips are affected by the turnip fly. An application of nitrate of soda hastens the growth, the plant is stronger, and gets more quickly past the stage when it would be killed. In buying manures a knowledge of what they contain is essential, as even an analysis is often misleading, and a farmer might be using for this year's crop something that would remain insoluble in the soil for twenty years. There is scarcely a known science that has not some application to agriculture; and one cannot be a specialist in them all; but a farmer should know enough about the most directly concerned to make his calling the most interesting in the world, and though he live to be a hundred he will still be learning.

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SLEEP-WALKING

Farmer Haykins is particularly proud of his apple tree, on which he spends a lot of time, with the result that the fruit forms his heart's delight and the envy of his neighbors. As might be expected, schoolboys have shown a particular fondness for these apples, and Farmer Haykins was heard to declare that trouble was in store for the first trespasser caught in his orchard.

One morning a neighbor dropped in on him, and after a few minutes' conversation remarked in an uneasy manner that his son was in a bad way.

"Oh, what's the matter with him?" asked the farmer sympathetically.

"He's become a sleep-walker. It's very sad," was the reply.

"So it is, so it is."

"And the worst part of it is," the other went on, "he's so fond of apples that I'm afraid one of these nights you'll catch him in your orchard. If you do for goodness' sake don't wake him. It's absolutely dangerous to do so."

Farmer Haykins shook his head thoughtfully.

"Well, you see," he said presently, "I don't quite know what to say. My bull-dog, wot I leaves in charge of the trees he's a sleep-walker, too, and I'm wonderin' wot will happen if the two meets."

But they never met.

Canadians in the United States

By E. J. EDWARDS, in the "Philadelphia Ledger."

OF course, the most conspicuous of all the brilliant citizens we have gained from Canada, within a century at least, and probably since the foundation of the Republic, is Jas. J. Hill. Everybody knows his romantic and truly sensational career—the boy of humble Canadian birth who created a real democratic empire in the northwest, materialized natural resources into wealth represented by thousands of millions of dollars, and taught the world a new lesson of railway construction and operation. Now recognized as one of the world's greatest personal forces, Mr. Hill, as a native-born Canadian who is an adopted nephew of Uncle Sam, is in a class all by himself as regards the other prominent Canadian-Americans.

Still, many of the others are not second rate in prominence by any manner of means. Take the Church and its allied activities, for example.

Francis Edward Clark, founder of one of the greatest non-denominational religious associations the world has ever known—the Young People's Christian Endeavor Society—was born in the province of Quebec. Prince Edward Island claims as one of its distinguished sons Albert B. Simpson, the father of the famous Christian Alliance, which has sent out hundreds of missionaries all over the world.

Like "Father" Clark, as he is affectionately called by millions of young people speaking the languages of the earth, the venerable Protestant Episcopal Bishop of New Hampshire, William Woodruff Niles, hails from Quebec province. So, also, that same section of Canada has given to the religious life of the republic the Rev. R. S. MacArthur, whose prominence in Baptist circles has led to his frequently being called the Baptist Pope. In the same

C. P. R. IRRIGATION WORKS, BASSANO, ALTA.

WESTERN CANADA IRRIGATION CONVENTION DELEGATES STARTING FOR THE BIG IRRIGATION DAM, BASSANO, ALTA.

category comes Thomas W. Campbell, who was elected Bishop of the Reformed Episcopal Church in Canada, and was presiding bishop for a time, and who voluntarily resigned his bishopric in order to accept a rectorship in this country.

The college and university quota of Canadian-Americans is led, unquestionably, by the president of Cornell, J. G. Schurman. Equally beyond question he is among the new world's educational giants. The University of Idaho is also headed by a former Canadian, James A. MacLean. One of the world's greatest authorities of the Hebrew language is James Henry Stevenson; he is a native of Ontario province, and occupies a chair at Vanderbilt University, around which the Hebrew savants often gather, figuratively speaking.

Harvard has several sons of Canada on its staff, among them Silas McVane, professor of modern and ancient history, and even Leland Stanford University boasts of a Canadian-born professor, H. R. Fairclough, who heads the Latin department of the "Harvard of the Pacific coast." Montague Chamberlain, one of the country's leading ornithologists, and for years secretary of the Lawrence Scientific School, Harvard, is a native of New Brunswick.

After Sir Gilbert Parker, who remains a Canadian still, though he now lives in England, Bliss Carman, of Boston, is doubtless the most prominent author of today, whose birth country is that which lies across our northern boundary. And just as Carman's "Vagabondia" made him famous in the world of letters, so Palmer Cox seized fame as an artist and humorist in this country by creating the Brownies, about which fairy people he had been told as a boy while living in Canada.

James Creelman and Acton Davies are two very prominent journalists who have come to us from Canada. As one of our leading dramatic critics, Mr. Davies is frequently called upon to give his expert opinions of the acting of a stage star who has come to us from Ottawa, Margaret Anglin. And fit subjects for Mr. Creelman's pen—if he has not written about them already—are the prominent Canadian-born trio in the halls of Congress—Phillip. Pitt Campbell, the "Octopus Hunter" from Kansas, in the lower house, and, in the upper, Jacob H. Gallinger, of New Hampshire, and picturesque old Isaac Stephenson, of Wisconsin, erstwhile beloved of his colleague, Robert La Follette.

Among architects of the United States who have gained distinction is Sydney R. Badgley, recognized the world over as a specialist in church architecture.

Horatio Walker is a leading American watercolor artist. Both men are Canadian born. So, also, are at least two leaders in American medicine. Dr. Walker Courtney, as chief surgeon of the North Pacific railway since 1888, and as former president of the Minnesota State Medical Society and of the Upper Mississippi Medical Society, is one of the best known men of medicine in our northwest. Also born in the province of Ontario, Frank Fairchild Westbrook, the brilliant pathologist and bacteriologist, who holds a professorship in the University of Minnesota, has a world wide fame among the scientists in his particular lines.

Canada has furnished some of the ablest electricians who have done great things in the United States. One is James Frank Morrison, of Baltimore, who built the first long-distance telephone line in the world, 210 miles, running from the old town of Georgetown, in the district of Columbia, to Cumberland, Md. As a consulting engineer John Alexander Low Waddell, born in Ontario province, is recognized by his colleagues as one of the world's own. And James Douglas, from Quebec, is one of the western continent's best known copper engineers, having advanced so greatly the very important business of mining and smelting copper that twice he has been president of the American Institute of Mining Engineers.

It was of a Canadian born navy man, Commander William S. Sims, that ex-President Roosevelt said that our fighting power is at least five times as great as it was before Sims introduced his methods of construction in the navy. You may recall that President Roosevelt was so impressed with the ability of Commander Sims that, at the president's order, the commander was placed in authority over the battleship Minnesota, thus becoming the first man of his rank to attain to the command of an American battleship. As assistant secretary to President Roosevelt, another former Canadian, Benjamin F. Barnes, was considerably in the limelight from time to time while President Taft's immediate predecessor occupied the White House.

Of these prominent Americans by

C. P. R. IRRIGATION WORKS, BASSANO, ALTA.

C. P. R. IRRIGATION WORKS, BASSANO, ALTA.

way of Canada, and of many more who could be mentioned, it is interesting to note that not a few have come up from the bottom of the ladder, all by the force of their own initiative, ability and ambition.

James J. Hill comes in this class, and, of course, leads it. Professor Montagu Chamberlain, the ornithologist, began life as a telegraph messenger boy, worked his way to a bookkeeper's stool, and finally became a partner in a large Canadian grocery business. Meantime he had entered the Canadian Army and worked his way up to a captaincy when he retired.

Senator Isaac Stephenson's family was almost as poor as the proverbial church mouse when he moved from Nova Scotia to this country, and during his youth the future multi-millionaire lumberman, farmer, banker and federal toga wearer had to scratch pretty lively for the bread with which to keep his stomach full. Congressman Philip Pitt Campbell, of Kansas, also knows from experience what it means to feel the pinch of poverty while getting new land under cultivation.

The father of the Christian Endeavor movement was left an orphan at the age of seven, and, although he was received as a son into the family of an uncle, the Rev. E. W. Clark, of Portland, Me., still it was all up to him to make himself. Palmer Cox, the Brownie man, almost starved in a New York garret until the idea came to him in his despair to utilize in picture the Brownie stories told him when a youngster. No sooner had the thought flashed into his head than he made a Brownie drawing, took it around to a magazine that had steadily refused the other work, and had it accepted in a jiffy. From that day to this he has never drawn any except Brownie pictures, and, bearing out the tradition associated with his eerie little people, they have certainly brought good luck to their modern friend in the shape of a comfortable fortune. And to show his gratefulness to his invisible little helpers, in the house that Mr. Cox has built with some of the money that the Brownies have brought him, he has a room fitted up for their own especial benefit and comfort. A feature of this tower-like room is the windows opening on the north, south, east and west, so that the

Brownies can have an unobstructed view in all directions.

Among still other Canadian-Americans who have lifted themselves well up on the ladder that most of us are engaged in climbing is James Frank Morrison, builder of the world's first long-distance telephone, and today one of Baltimore's best known citizens.

Although privately educated, Mr. Morrison taught himself telegraphy. Then, as night operator for the Baltimore and Ohio Railroad, from the second year of the Civil War until three years after its close, he studied diligently the new industry of electricity as applicable to other things than the transmission of telegraphic messages and experiments in college laboratories. As a result—and after being night manager for the Western Union in Baltimore, entirely reorganizing the Baltimore fire alarm system, and building the world's first long-distance telephone line—he became a pioneer in the electric lighting field. As such he built the first complete lighting station in Baltimore, and from that day to this he has been looked upon in electrical circles as a leader, especially in the field of electric lighting.

But this son of Canada is nothing if not versatile; electricity has been only one of several fields of endeavor for him. Almost ever since Baltimore has known him he has taken a lively interest in that city's politics, and his political offices have varied from that of warden of the city jail to fire commissioner. Then, too, he is an art connoisseur, one of the best that the Maryland metropolis can boast, and one who can hold his own with any art connoisseur of the country. Oh, yes, James Frank Morrison is a man of parts, though the biggest part of him is devoted to electric construction and manufacture, by means of which he has amassed a bank account that causes him no anxiety as to how he will be able to provide for himself in his old age.

Today Mr. Morrison is only 68—only, because he doesn't look that number of years by a good 15 or so. He was 14 when he got his first employment in this country, and not so very much older when he began his electrical

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WESTERN IRRIGATION CONVENTION DELEGATES' FIRST GLIMPSE OF C. P R. IRRIGATION WORKS, BASSANO, ALTA., AUGUST 11, 1911

career by deciphering the clicks of the Morse code.

In the big telephone and electric lighting offices of the country, Mr. Morrison's name is spoken of with almost the same respect and admiration which the names of Edison, of Bell and of Marconi cause. For the telephone was only two or three years old when he actually demonstrated that it was possible to send speech over a wire more than 200 miles in length. At that time not even Alexander Graham Bell himself dared to predict a much greater use of the telephone than that possible within the boundaries of a city or town.

As a consulting engineer, and especially as a bridge engineer, John Alexander Low Waddell, a native of Ontario province, who now has his home in Kansas City, has few living peers.

His ability as a bridge builder has been revealed by actual deeds the world over. After graduating from an American polytechnic institute in 1875, he got a job with the Canadian Pacific at the time the engineers were taking that railroad through the most difficult part of the Rocky Mountains. Here he received his actual schooling in bridge-building, and today his bridges are to be found in Canada, the United States and Japan, among other countries. For the work as the principal engineer for the Trans-Alaska-Siberian railway he was decorated by the Grand Duchess Olga of Russia, and because his bridges in Japan and his work as professor of civil engineering in the Imperial University of Japan so pleased the island empire, the Mikado decorated him a knight commander of the Order of the Rising Sun.

Mr. Waddell is now much occupied with the important railway work in progress in the southwest. He is a member of practically every one of the great engineering societies of America, Europe and Asia, and his numerous professional papers are standards the engineering world over.

Now in his 56th year, Mr. Waddell's hobby since boyhood has been the great big out-of-doors. When his work does not take him there—and it does pretty frequently—he looks around for some excuse that will take him there; and nothing delights him so much as to have the time to set down on paper some of the delights that come to the man who gets thoroughly in touch with Nature at first hand.

Like Mr. Waddell, Bliss Carman, possibly the most prominent of the authors who have come to us from Canada, first came here to finish his education, and ever since then he has been identified with American life and literature.

Before Carman—who was christened William Bliss, but discovered it was to his professional advantage to drop the William—found himself, he was in a fair way of becoming a jack of all trades. He thought he had in him the makings of a great lawyer, so he studied law. Then it occurred to him that he was better fitted to be a civil engineer, thinking, as Thoreau did, that he could earn his living as an engineer or surveyor and use his spare time in writing literature.

But he soon tired of engineering and then attempted to teach school. He has confessed that that was for him about the most tiresome drudgery that he ever ran up against. So he undertook newspaper work, wrote for various periodicals and became an office editor. Then a year or two later came his "Songs from Vagabondia," written in collaboration with Richard Hovey, and it was at once apparent both to Carman and his critics that he had found himself at last.

As every native-born Canadian should be, Poet Carman is passionately fond of the open. He is an expert with the snowshoe; no Indian can better his canoeing, and many's the time he has shot rapids in a birch bark canoe that only the hardiest canoeist ever attempts to shoot. As a boy he practically lived out-of-doors, and, though that life doubtless caused him to grow exceedingly tall, it did not fill him out correspondingly.

Thus, though Carman has a physique that is not popularly supposed to belong to a poet, he nevertheless has the traditional poet's individuality. He's dreamy, and he's got the hair—a wonderful shock of heavy, shaggy hair that makes him a marked man whenever he enters a public conveyance.

Canadian-born Americans, like Waddell and Morrison and Carman, are widely known, but the Canadian-American whose name is acclaimed around the world, and in every country and corner thereof, is he who came to this country an orphan—the Rev. Dr. Francis Edward Clark, creator of the world-enveloping Christian Endeavor movement.

C. P. R. IRRIGATION WORKS, BASSANO, ALTA.

Our Ottawa Letter

FROM OUR OWN REPRESENTATIVE AT THE NATIONAL CAPITAL

THE subject of packing fruit is exhaustively dealt with by Mr. W. A. Mackinnon, Canada's Trade Commissioner at Birmingham, England, in a report to the Department of Trade and Commerce. In no other market of the world, says Mr. MacKinnon, is the question of packing and packages so important as in England, where purchasers of all classes of goods are accustomed to see them put up attractively as well as substantially. This is particularly the case with fruit, whether it be the package used in transit or that in which it is displayed for sale, and in this respect Canada is declared by competent observers to be behind some of her competitors. Taking small fruit first, such as strawberries, raspberries and currants, a popular package used in the home market is what is known as the "chip," an oblong basket measuring 12 inches by 6½ inches and holding about 6 lb of fruit, with a handle of wood or metal. These chips are, in fact, very similar to the Canadian 10 lb. grape baskets, but slightly wider, shallower and shorter. Strawberries are picked direct into these baskets, and are sometimes shipped without a covering. At the most, a piece of thin pink or white paper is placed over the fruit, the edges turned down with string running around the outside of the basket. French shippers send large quantities of strawberries to the English markets packed in small wooden "boats," which consist merely of a flat bottom with sides and ends sloping outwards, barge-like. These are filled with fruit, then tied together in pairs, each forming a cover for the other. The "boat" holds 3 to 4 lb. of fruit, and owing to its solidity and the ease with which the double package can be tossed from hand to hand in transhipment (there being no vacant spaces to allow play for the fruit), this style of package seems quite popular, and was strongly supported at a recent meeting of fruit-growers called to consider the question of improvements in transportation facilities generally.

English plums are usually sent to market in round and rather shallow wicker baskets. They are called "half-sieves" or "half-bushels," and hold about 24 lb. of plums. They have the name of the dealer printed on the outside, and are what are called "returnables," as they have to be sent back to the dealer, having cost him about one shilling, or 25 cents, each. This kind of package is also very popular for gooseberries, best pears, and cherries. Choice plums, shipped somewhat extensively to the English markets from South Africa with success, are packed in shallow wooden cases about 3 inches deep, well protected with wood wool at top and bottom of case, each plum being wrapped in paper.

For peaches the package considered most suitable is the shallow wooden case about 4 inches deep. The bottom should be covered with a thick pad of fine wood wool, on which the peaches are placed, each wrapped in paper and separated from one another by little pads of the packing material. Another layer of wood wool should cover all. Holland has been sending peaches to the English markets, and on the whole the experiment may be considered successful. The single-layer package, now so popular, is adopted, but with a different kind of packing. Cotton wool is used instead of wood wool. The boxes are first lined with the cotton wool, then each peach is wrapped in the same material, with wads between to prevent bruising. The cotton wool packing, however, is pronounced by some to be too heating and fine wood wool declared superior in every way.

Home-grown pears are packed in the same way as plums—in round, shallow wicker baskets, and it is said it will be difficult to improve on this description of package. French pears come to England in two-layer wooden cases, commonly made of slatwood, holding about 12 lb. of fruit. The pears are placed on a bed of wood wool and covered with another layer. More pears are placed on top of this and a further pad of wood wool covers all. These pears carry very well, but some receivers would prefer each pear being wrapped in paper.

For apples, as is well known to Canadian exporters, the most familiar package in the English markets is the barrel, which occurs in three types—the flat-hooped "Canadian barrel," the Nova Scotia spruce barrel with half-round hoops, and the United States barrel, which is similar to that used in Ontario, but, like the Nova Scotia barrel, slightly smaller. Of this package Mr. MacKinnon is of opinion that little need be said except that for the great bulk of the ordinary crop of every year it is the best that can be devised. The use of eight hoops instead of six is, however, well worth the extra cost, both as producing a firmer and more rigid barrel and as providing a most effective insurance against collapse of the package through the breaking of a single hoop. By way of contrast, the home-made packages found in the Birmingham market are mentioned. They vary greatly in size, shape and material, but for the most part are of the hamper type, being closely-woven square-cornered wicker baskets, unprovided, as a rule, with covers. These hampers are lined with straw or other soft material, and the fruit appears to be poured in without any attempt at arranging or packing, though, indeed, it is sometimes the case that the best fruit is reserved for the last, "topping off" the package most effectively. In such packages as these some of the best home-grown fruit is offered for sale. But even Irish growers, who are beginning to produce some excellent varieties and make good profits, do not appear to have seriously considered the desirability of adopting a package which will show the fruit at its best. There is no possible doubt, says Mr. MacKinnon, that English and Irish apples would bring a much higher price if growers took the same trouble to grade and pack them as they do with the smaller fruits.

At the other extreme, from the careless style and methods of the English packers, is the product of those who have adopted variations of the standard 40 lb. box as known in Canada. Many of Canada's keenest competitors use the 40 lb. box, to the exclusion of all others. Take the Oregon Newtown Pippin, looked upon by many as the finest dessert apple that can be purchased in the British Isles. These apples are never sent to the British market in other than the 40 lb. box, packed neatly in rows and tiers, the number of the latter being indicated on the outside of the package. California Newtowns, inferior to those from Oregon, and bringing shillings less per box in the market, are also carefully put up, each apple being wrapped in paper and the box exactly filled with specimens of a nearly uniform size. Australia has a somewhat similar package, though frequently of a rougher and harder wood, making a less attractive appearance, and South Africa is sending her apples over to England in packages of such a character that many declare the South African packing to be the best in the world. The British trade in boxed apples, as pointed out in a recent report of the Canadian Acting Trade Commissioner for Manchester, is, indeed, visibly and vastly increasing every year, and Canada seems to have almost no part worth talking of in this increase. Whatever may be said to be the fact that British fruit importers, generally, are accustomed to and therefore prefer Canadian apples in barrels, and that the same claim is made with regard to United States fruit, yet this has proved no obstacle to the Oregon and California packers, who find a ready market for their goods, though never put up in barrels. It may be said at once that the difference lies in the fact that the latter aim at shipping nothing but choice fruit, and therein, indeed, lies the secret, though it cannot be truthfully asserted that no inferior lots ever come even from California. The British storekeeper or consumer likes to find in the packages he purchases only carefully selected first quality fruit.

Summing up, Mr. MacKinnon claims that no Canadian who knows the conditions would deny for a moment that Canada has annually an immense quantity of strictly first-class fruit to export. When it is urged that she should take advantage of the increasing demands for boxed apples and secure her rightful share of this trade, it is always and only intended that she should adopt the small package for finest varieties alone and for carefully selected specimens of those varieties.

British Columbia, Mr. MacKinnon remarks, it is only fair to state, has set an example in this matter which the rest of Canada would do well to follow. The boxes of British Columbia fruit are beautifully packed, and as the fruit itself is always most carefully selected, these boxes have established a reputation second to none in Great Britain. The only complaint ever heard is that so few of them are put up. There may be many reasons why British Columbia is unable to export larger quantities of choice fruit packed in boxes, one of which is the lucrative market offered in the nearby provinces of Alberta and Saskatchewan; but such reasons do not apply as obstacles to Eastern Canadian shippers adopting the methods of the West. Obviously it would be quite easy to lose money through lack of care in selection or in packing the fruit, but there is every reason to suppose that any who undertake the matter seriously and ship to the United Kingdom 40 lb. boxes, neat and attractive-looking on the outside, and containing nothing but choice fruit, will undoubtedly reap a rich reward.

The first apple report for the season 1911-12 of Messrs. Woodall & Co. deals with the receipts of last season and the prospects for that which is beginning. The receipts last season at Liverpool, which lasted to the end of April, including boxes calculated at three to the barrel, were 638,373 barrels, as against 870,168 barrels in 1909-10, the total arrivals into the United Kingdom being 1,642,202 barrels. The past season must be considered satisfactory to shippers, as there was a high range of prices, and towards the close some record sales were made for barrels. The increased quantity of box apples, mostly Californian and Oregon, was again a noticeable feature, being approximately 360,000 boxes as against 170,000 boxes in the season of 1909-10. The quality was generally satisfactory, and the condition, with the exception of a few occasional cars, good. There was an active demand throughout, and results should meet the approval of shippers. The prospects for the coming season may be considered about an average. The early marketing of English apples may, perhaps, cause a lower opening range of prices, but their quality does not compete when American and Canadian begin to arrive, and this season they will be probably less attractive than usual.

Mr. E. D. Arnaud, Canadian' Trade Commissioner at Bristol, England, in his last report, reported as follows on the fruit prospects prevailing at the time of writing: "Owing to the excessively dry and hot weather that has prevailed in this district for several weeks past, all fruit crops have suffered severely, and it is expected that the yield of all kinds, including apples, will be less than an average crop. Already attention is being directed to the shortage in cider apples, and very high prices are looked for. From these conditions it may very reasonably be inferred that the demand for Canadian apples of sound quality will be distinctly good for the coming season of export."

Following up the references made in former letters in this correspondence to the Cuban markets for northern fruits, I may quote from the last report to the Department of Trade and Commerce from Mr. J. E. Ray, Canadian Trade Commissioner at Havana. He states that several of the fruit importing firms he had interviewed indicated a desire to purchase Canadian apples, but their experience in the past forced them to emphasize the indispensability of uniformity in size and color. Too frequently they have found an excellent layer of apples on the top of barrels from Eastern Canada, only to discover those underneath were small and rotting. The Oregon Pippin seems to be the standard of excellence, being retailed at from 10 to 15 cents each. One firm assured the Commissioner they could offer excellent prices if a guarantee could be given that only the very best fruit would be shipped. The principal source of Cuba's grape supply is Spain. The large, juicy and fleshy Malaga grapes are in great demand, and preferred even to the Californian. Apparently Canadians have not attempted to enter the Cuban market, and it is for Ontario shippers to compare the quality of their products with those of Spain. For speedy delivery grapes should be packed in barrels and shipped via New York. Plums to the value of $10,000 are imported annually from the United States, but Canadian shippers have given no attention to the Cuban market with respect to this fruit. As such excellent prices are obtainable for plums, peaches and apricots, an attempt to obtain a footing in Cuba should meet with ample reward. It would be necessary to rush them to Havana via New York.

British and foreign fruit prospects are referred to in the last report of the Fruit Division, Dairy and Cold Storage Branch, Department of Agriculture, as follows:

"England.—All reports agree that the apple crop will be medium, though it is pointed out that in the Gloucestershire district apples have stood the drought better than any other kind of fruit, and that fairly good crops are expected of the better varieties.

"The continued drought has been responsible for a still further thinning of the pear crop, and very few remain.

"An abundant yield of plums was looked for early in the season, but the heat and dry weather diminished the crop to such an extent that not more than half a crop is now expected.

"Ireland.—All varieties of apples are a light crop, especially the Bramley Seedling, which is a leading winter variety. Plums will also be light.

"Germany.—Apple crop poor. Plums below the average.

"France.—Good crop of both apples and pears.

"Italy and Holland.—Heavy crops of apples expected in both countries.

"United States.—According to the American Agriculturist of the 12th inst., the apple crop of the Middle West suffered some deterioration during the month of July, largely on account of a further drop of matured fruit resulting from the drought and hot weather, but in spite of this decline there is still a prospect for a crop that is little, if any, below a normal production. In some states the crop will be the best in years, and, taken as a whole, there is every prospect of an abundance of apples. It is reported that Illinois will have only 25 per cent. of an average apple crop.

"The tent caterpillar is again reported by numerous correspondents in New Brunswick and Quebec. In the counties of Essex and Elgin the San Jose scale is reported in orchards not thoroughly sprayed; and the codlin moth has been ravaging unsprayed orchards in District 2. In Nova Scotia the aphis is reported occasionally, and has done considerable damage to the young trees. Aphis and caterpillars are reported in a few instances from the interior valleys of British Columbia. Generally speaking, however, insect pests have not been as prevalent as usual, owing to the increased attention which has been given to spraying this year. A noteworthy feature about the reports received from correspondents this month is the fact that there is absolutely no mention of injury to the fruit crops as the result of fungus diseases."

So far—that is, early this season, the report states, the apples on sale in Montreal, Toronto and Ottawa had not, as a rule, been at all inviting. Most of the apples in barrels were marked "No. 2" and "No. 3," but the baskets were ungraded and carelessly packed. A small proportion of the receipts was matured and well colored, and these realized good prices, but the remainder was disposed of at low figures.

Complaints of inferior apples being sold on the markets of the large centres of population in Eastern Canada this year were brought to the attention of Mr. J. A. Ruddick, Dominion Dairy and Cold Storage Commissioner, at the beginning of the season. The Commissioner was seen on the subject by the representative of a local paper, the "Citizen," and said the fruit inspectors had reported a large number of cases where green, immature fruit had been on sale and evidence was being gathered for the purpose of prosecuting the offenders. The fruit complained of was found to be wormy, stunted and very small. One reason for this was that the growers were anxious to reach the early markets, when prices were the highest. "It is getting worse every year," he went on to say. "This sort of thing, to my mind, is only injuring the fruit trade. The growers are in reality losing by it in the long run. People buy these green apples in the early season, and the edge of their appetite for more is taken away. They imagine that anything they buy in the future will be just as bad, so that when the mature apples are placed on the market they are not bought as readily as they should be. Of course, we have had a number of heavy wind storms this year, and they are responsible in a measure for the prevalence of green fruit on the market. However, it doesn't matter from what cause the evil arises, we intend to nip it in the bud."

The regular apple season had not really opened at the time the Commissioner spoke, but good fruit was beginning to come in. "The fruit generally this year," Mr. Ruddick went on to say, "is of an exceptionally fine quality. In fact, it is many years since we have had such clean, well-colored apples as we have this year. But the health authorities should stop the sale of this other kind of fruit. I saw some specimens of green fruit in a store the other day, and I asked the clerk if he gave a bottle of painkiller with every purchase." This was a couple of weeks ago, and the unripe stuff unfit for human consumption is now seen no more.

It will surprise many readers of *The Fruit Magazine, Scientific Farmer and Canadian Citizen* to learn that pears of good quality are now grown in the Ottawa Valley. Fair samples of the fruit grown on Mr. Alonzo Klock's farm near Aylmer, Que., are pronounced by Mr. W. J. Corby, fruit importer this city this season, magnificent specimens of the "Flemish Beauty" family. The production of Ottawa Valley pears for the table is, however, limited.

Canada's fruit inspection service is now fully organized. Mr. W. W. Brown has been made senior inspector and will give special attention to the work at Montreal and in the Lake Ontario section. Mr. P. J. Carey, in addition to his duties as fruit inspector, will devote a part of his time to demonstrations and instruction in box packing. Arrangements are being made for him to visit Nova Scotia in that connection.

"North Somerset," a well-known contributor to the English agricultural papers, has been touring Canada. In a letter to the "Western Daily Press," Bristol, England, he mentions a visit to Queenstown. "Here," he writes, "waiting on the quay, was as choice a lot of fruit as anyone could wish to see, and the manner in which it was handled was very fine. Narrow trolleys, with four wheels: on these were built tiers of shelves to take baskets of peaches, plums, tomatoes, and apples. These were fixed in by side rails. Thus a trolley load was run into the ferry boat, off the ferry boat on to the landing stage, run along this, and taken on to the steamer that was to take us back to Toronto. There the fruit was again unloaded, and not a bruise could I see on any of the fruit. If only our soft fruit traffic in England could be handled the same way, what a gain it would be all round! As we cast off from the landing stage and began to glide down the river, with its wooded banks, the harvest moon just rising and later flooding the lake with all its beauty, Brock's Monument had faded from sight. I was looking at those peaches, and commenting how lovely they looked, when a lady remarked, 'Would you like to taste one?' 'Certainly, but they are being consigned.' 'Yes, but I will get you one.' Next day I found a small basket of peaches at my hotel. Canadian ladies can evidently be as good as their word. This peach trade must be a remunerative one, if they could only be put on the English market. Fancy being able to obtain a big bag of peaches for 5d. For once I did myself well on peaches and cream for breakfast next morning before starting for Guelph."

Irrigation vs. Non-Irrigation

MR. JAMES JOHNSTONE, of Nelson, B. C., sends us the following communication:

To the Editor of *The Fruit Magazine, Scientific Farmer and Canadian Citizen,*

Sir,—An Anglo-Indian Army officer resident here has sent me a clipping from "The Pioneer," published at Allahabad, India, with the following note: "My dear Johnstone,—The enclosed, sent me from India, may amuse you. The writer is, I know, interested in land in Walhachin and the Nicola Valley. It is cut from 'The Pioneer' of Allahabad, India, the best paper of that country." The letter follows:

RECIPROCITY AND FRUIT-FARMING

To the Editor:

Sir,—Of late I have frequently received letters from Anglo-Indians asking as to the probable effects of the reciprocity treaty between Canada and the United States on the British Columbia fruit-farming industry. In reply I would say briefly: That so far as the "dry belt" fruit industry is concerned, the probable effect of the treaty will be to differentiate sharply between fruit grown under irrigation and fruit that is not so grown, in favor of the former class.

I think the reciprocity treaty will hit the wet belt man—i.e., the man who grows fruit without artificial irrigation—because the irrigated fruit is distinguished by its superior keeping qualities, and the wholesale dealers will buy it in preference to the softer apples grown without irrigation, if they can possibly get the irrigated fruit. They will also give a much higher price for it.

I have only to mention that at the great Canadian Apple Show at Vancouver last autumn 95 per cent. of the prizes and awards went to irrigated fruit, to emphasize this point.

The superior keeping quality of the irrigated apple is a fact well known both to the horticultural expert and the wholesale dealer, though it is often denied by the disreputable wet belt real-estate agent and land shark. These gentry usually operate in a district where no irrigation is required—partly because no great capital is needed to acquire a tract of land and cut it up into fruit farms in the wet belt or semi-wet belt, whereas in the dry belt extensive capital is necessary to construct the irrigation system before land can be sold, and partly because it is ever so much easier to sell orchard plots in a non-irrigation district to raw Englishmen who are apt to dislike conditions of horticulture that are new to them. But your experienced and successful American apple-grower when he moves into British Columbia to grow apples almost invariably selects an irrigation district in preference to one where he is told "no irrigation is required."

So far as the "States" are concerned, the apple-growing industry during the past 15 years has been concentrating itself into the irrigation districts, and the orchards in the non-irrigation districts are going out of cultivation on account of the admitted superiority of the irrigated fruit. For this reason, and during this period, the apple production of the States fell, I believe, from roughly 65 million barrels to 28 million barrels. Both the Canadian of the prairie and the population of the United States appreciate the difference between irrigated and non-irrigated apples, and the superior keeping qualities of the former. At present there are not enough irrigated apples grown in British Columbia to meet the home requirements, let alone the demand of the prairie, and the effect of reciprocity will only be to bring in from the States a sufficient quantity of irrigated apples, if they can be got, to meet the deficiency of the Canadian supply. This will, of course, hit the softer apple of the wet belt—an apple grown without irrigation—and that is why the wet belt man, but not the dry belt man, dreads reciprocity. For the dry belt man reciprocity simply means a bigger market and bigger prices for his fruit. In other words, the wet belt will be hit by reciprocity and the dry belt benefit. I am not a politician, and I may dislike reciprocity for other reasons, but I cannot truthfully say it is going to hurt the dry belt man, rather the contrary. I would strongly advise Anglo-Indians who are thinking of becoming fruit farmers in British Columbia to make up their minds to settle somewhere on the dry belt. The three best districts at present are: Kelowna and Coldstream in the Okanagan, and Walhachin in the Thompson River Valley. I might also add Summerland and Penticton. In all these three places apples are grown under irrigation conditions only. The real-estate man in other places endeavors to make a point in favor of his particular district when he says "irrigation is not required," but the expert fruit farmer from Washington and Oregon States knows perfectly well that it is not a case of going to a district where irrigation is not required, but looking out for a district where it is. You can grow grapes outside in the open in a district where irrigation is not required, instead of in a hothouse where it is, but, of course, there is no comparison between the produce. The Anglo-Indian is, perhaps, better off than the average Englishman, because he can see horticulture under irrigation conditions in India, and you cannot in England, and so is less likely to be influenced by the specious utterances of the real-estate man when he presses him to go to a district where irrigation is not required to grow apples.

At Kelowna and Coldstream I believe arrangements can be made for the care of newly-planted orchard land till such time as it comes into bearing and the owner takes it up, and at Walhachin they have a system of land certificates under which the newly planted orchard land can be bought and cared for in a similar fashion for any length of time up to the moment the purchaser arrives on the scene and takes up the land. There is a very limited quantity of this land, and those who intend to avail themselves of the land certificate scheme should communicate direct with the resident local manager of the Walhachin Estate, Walhachin, B. C.

I might add that I have no financial interest in the sale of this or any other fruit land in British Columbia.

J. S. REDMAYN.

Royal Societies Club, 62 James street, May 29.

Such a pack of gross misrepresentation and nonsense as this letter to you signed by J. S. Redmayn contains would amuse me immensely, and would be unworthy of notice did I not know that many of your foreign readers are anxious to know the true conditions of fruit-growing in British Columbia. I have been an officer of the B. C. Fruitgrowers' Association during the past nine years, and I know most of the fruit-growing districts of the province very well indeed, but I have never yet known a man living in the irrigation belts who for one moment would maintain that his fruit was of a better flavor or would keep longer than mine, grown on Kootenay Lake, where irrigation is unnecessary except on dry, light soils during a very dry season.

Mr. Redmayn omitted to state that the reason why a large percentage of the prizes at the First Canadian National Apple Show were awarded to fruit grown under irrigation was that 95 per cent. of the fruit exhibited was grown under irrigation, and he also forgot to state that last year the Royal Agricultural Society of London, England, offered a special prize and cup for the best 10 boxes of dessert apples, the special feature of this exhibit being the quality and flavor of the fruit. The result was that one of the most impartial tribunals in the world awarded first to Salmon Arm and second to Kaslo, on Kootenay Lake. These places grow apples entirely without irrigation. I admit that fruit can be grown with irrigation which is almost as good as that grown without, but only one man in a hundred succeeds in doing so. When I first came to British Columbia almost all the fruit on the market was grown under irrigation either in the United States or in the dry belt of British Columbia, and it was then a common saying that British Columbia apples were only good to look at. It took some time to persuade my friends who were sending to Eastern Canada for their apples to purchase British Columbia non-irrigated fruit. Now, however, that unirrigated fruit can be purchased, no Eastern apples are sold in British Columbia. If the fruit grown without irrigation were not recognized as the best, why should one see at every show at Spokane, Washington, large signs stating that such-and-such fruit is grown without irrigation and is of the finest flavor and best keeping quality? Fruit with such notices over it will be exhibited by the same owner, who will have irrigated fruit alongside on same stand. Besides, it is a practical fact that we in the unirrigated districts of Kootenay do not think of placing our winter apples on the market until all irrigated stock is out of the market, and we can then get 50c per box more for our product. Mr. Redmayn's illustration of the hothouse grape being superior to the grape grown under natural conditions only proves the opposite of what he attempts to prove, because every expert horticulturist knows that the hothouse grape derives much of its perfect flavor through the skin of the fruit and leaves of the vine being continually exposed to an excessively hot and humid atmosphere well adapted for flavoring the grape, which it would be impossible to find outside the glass enclosure. In the same way an apple of perfect flavor derives a large part of its excellence through the skin of the fruit and leaves of the tree being exposed to a slightly moist atmosphere. As a rule, an apple produced in the arid fruit belt grows in a dry, scorching atmosphere resembling that of the desert of Sahara, and it is thus compelled to procure its entire sap and flavor from the moisture kept in the ground at the roots of the tree by irrigation.

I would strongly advise all Anglo-Indians to avoid purchasing land until they have thoroughly looked over the various sections of British Columbia and have decided for themselves which conditions they like best. I spent years looking for a place exactly to my taste and only found what I wanted when I arrived on Kootenay Lake. It by no means follows that everyone would be as charmed with Kootenay as I am. I detest autos and dusty roads, and prefer to glide through the sparkling waters of our lakes and rivers in my launch, clean and fresh, greeting my friends at their homes along the shores. Some people are not happy except in a cloud of auto dust or in a combined mixture of dust and the perfume of a stable. I know the class of Anglo-Indian officer who cannot stand the thought of vegetating at home after 20 or 30 years of active service, and yet he cannot afford to keep up a shooting and country home in England or Scotland. For such a one a small fruit ranch of, say, 25 acres on the shores of Kootenay Lake will often prove the ideal he is looking for, because he is surrounded by the finest of scenery, the climate is perfect at all seasons of the year, the shooting and fishing at his door are the best on this continent, and after six or seven years he will find that his five acres of fruit, with cows, hens, etc., will pay all his expenses at least, and will leave his pension as pocket money or for profitable investment in this rich, expanding country. If any of your British readers come to British Columbia I shall be pleased to show them over my pet district, and they need not be afraid that they have fallen into the hands of one of Mr. Redmayn's "disreputable wet-belt land sharks," because I will not advise them to purchase any land in Kootenay until they have seen all good sections of British Columbia, including even the worst wildcat schemes in the arid regions, and I will be pleased to give them letters of introduction to my fellow-officers of our association, who are the best and most successful practical fruit-growers in their respective districts. I am too deeply interested in the prosperity of Kootenay to persuade anyone to locate there unless I am satisfied that in all future years he will be persuaded that he chose the one spot most suitable to the requirements and tastes of himself and family in every way. We have a nice social chat and congenial society, but I do not wish to encourage the man or woman who wishes to do nothing, and who must have his club or her bridge seven days in the week. We don't wish them in Kootenay, but I will be pleased to tell them where to go.

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UGH!

A young actor called on his best girl. He was rather before his time, so as she hadn't quite completed her toilet she sent her little brother to entertain him in the drawing-room.

"Would you like some candy?" asked little Henry.

"I don't mind," said the young man.

Henry promptly produced a small piece of sticky candy, and the young man, wishing to make friends with all the members of his lady love's family, put it in his mouth.

Little Henry watched him earnestly until the candy was swallowed. Then he asked, "Did you like that?"

"Oh, yes!" was the reply.

"Fido didn't," Henry explained. "I gave it to him first, but he spat it out twice."

Western Canada Irrigation Convention Great Success

Text and Photographs by NORMAN S RANKIN

THE fifth annual convention of the Western Canada Irrigation Association, held in Calgary on Tuesday, Wednesday and Thursday, August 8, 9 and 10, was a great success. Seventy-three delegates from British Columbia, Saskatchewan, Alberta and Ontario attended the convention, and while numerically this attendance was not so great as last year, the results accomplished and the resolutions passed were probably the most important in the history of the association.

Among the features of the convention were lectures by Professor B. A. Etcheverry, of Berkeley, California, who delivered an interesting address on "Pumping for Irrigation"; a paper by Professor W. J. Elliott, superintendent of agriculture, Irrigation Department C. P. R., on "The True Significance of Irrigation"; a paper by W. H. Fairfield, superintendent Dominion Experimental Farm, Lethbridge, Alberta, on "Local Farm Products and Irrigation"; an address by E. C. Thrupp, A.M.Inst. C.E., Kamloops, B. C., on "The Relative Advantages of Continual and Intermittent Irrigation"; an illustrated lecture by Mr. A. S. Dawson, chief engineer Irrigation Department C. P. R., on "The Irrigation Project of the C. P. R."; and a paper by R. E. Stockton, superintendent maintenance and operation C. P. R., on "The Operation of Irrigation Systems." An exhibition of the C. P. I. C. moving pictures, "Homemaking in Alberta," together with a short talk illustrated with lantern slides, was given the evening of the first day's session by the local secretary of the association. Other speakers were James White, secretary Canada Conservation Commission, Ottawa; R. H. Campbell, Superintendent of Forestry, Department of Interior, Ottawa; W. S. Ross, Minister of Lands, Victoria, B. C.; A. V. White, Canada Conservation Commission, Ottawa; F. J. Fulton, K.C., ex-Minister of Works, B. C., Kamloops, B. C.; J. T. Hall, permanent secretary of Western Canada Irrigation Association; Maxwell Smith, editor *The Fruit Magazine, Scientific Farmer and Canadian Citizen*, Vancouver, B. C.; R. N. Agur, of Summerland, B. C.; C. W. Peterson, superintendent of Irrigation C. P. R.; J. S. Dennis, manager Irrigation and Land Departments C. P. R.

His Honor Lieut.-Governor Bulyea opened the meeting, and was followed by Mr. C. W. Peterson, resigning president, who in turn gave way to Mr. R. H. Campbell, elected chairman of the session.

During the convention a luncheon was tendered the delegates by the Calgary Board of Trade and City Council, at which Acting-Mayor Brocklebank presided, assisted by W. D. Spence, city clerk, and Andrew Millar, publicity commissioner, and a trip to Bassano arranged by the local committee.

The excursion to Bassano was one of the most interesting features of the convention. The party, after partaking of a hearty luncheon given by the Bassano Board of Trade and City Council, proceeded in carriages to visit the huge irrigation dam now under construction at Horseshoe Bend, three miles south of Bassano. On the return journey a stop was made at Strathmore, where the delegates and visitors were treated to a feast of strawberries and cream, the product of the C. P. R. demonstration farm, in order that the delegates might be convinced of the size and excellence of Alberta berries.

Officers for the ensuing year were elected as follows: Hon. president.

Hon. Mr. Paterson, Lieutenant-Governor B. C.; president, Hon. W. S. Ross, Minister of Lands, B. C.; first vice-president, J. S. Dennis, manager Irrigation, Alberta and B. C. Lands Departments; second vice-president, R. Agur, Summerland, B. C.; treasurer, P. Dumoulin, Bank of Montreal, Kelowna, B. C.; permanent secretary, Norman S. Rankin, Calgary; executive, R. J. Fulton, K.C., Kamloops, B. C.; J. F. Pearce, British Columbia Land Commissioner; E. M. Carruthers, Kelowna, B. C.; W. H. Fairfield, Lethbridge; C. W. Peterson, superintendent of irrigation, Calgary; Professor Elliott, superintendent of agriculture C. P. R., Strathmore; M. Ricardo, Kamloops, B. C.; and R. M. Palmer, Kamloops, B. C.

Kelowna, B. C., was chosen as the next place of meeting.

The following are among the most important resolutions passed by the Convention:

Notice of motion to be taken up at the next annual Convention was given as follows:

Whereas, the experience of the previous conventions of this Association has shown that the problems and questions in connection with irrigation in the province of British Columbia are widely different from those in the provinces of Alberta and Saskatchewan, and has also shown that the number of delegates from British Columbia attending the meetings when held in Alberta or Saskatchewan is very small, as is also the number of delegates from Alberta and Saskatchewan when the meetings are held in British Columbia;

Therefore be it resolved that in the opinion of this Convention, it is advisable to form separate Associations in the province of British Columbia and in the provinces of Alberta and Saskatchewan, which, while remaining affiliated with each other, will hold their conventions separately.

RESOLUTION NO. 2

Whereas, the conservation of the forests on the east slope of the Rocky Mountains, so as to promote the gradual melting of the snow and equalization of the run-off of storm waters, is one of the most important factors in the successful irrigation development of Southern Alberta; and

Whereas, an Order-in-Council has recently been passed greatly restricting the area of the Rocky Mountain Park and thus withdrawing from the area now excluded the close fire guarding and general conservation which has, in the past, been devoted to the said park;

Therefore be it resolved that the Honorable Minister of the Interior be requested either to extend the boundaries of the Rocky Mountain Park to cover the original area set apart or to greatly augment the fire guardian service now in successful operation in the forest reserves in the Rocky Mountains, in order to adequately cover the area now excluded from the jurisdiction of the parks administration. Carried.

RESOLUTION NO. 3

Whereas, a knowledge of the practical duty of water for various crops has a most important bearing on irrigation development; and

Whereas, information upon this important question, available in any of the provinces of Alberta, Saskatchewan and British Columbia, is vague and incomplete;

Therefore be it resolved that the attention of the Governments interested should be directed to this important matter, and that they should be urged to carry out a thorough system of investigation to determine the duty of water in the different provinces and for the different crops, so that such duty may then be determined by approximate exactness. Carried.

RESOLUTION NO. 4

Whereas, an accurate knowledge of the location and quantity of water supply available is the basis of irrigation development; and

Whereas, the matter of topographical and hydrographical surveys to determine the location and quantity of such water supply and the proper methods of conserving it must be undertaken by the Government administering the law relating to the use of such water;

Therefore be it resolved that this Convention urges strongly upon the

Dominion Government the importance of making the necessary appropriations and providing the necessary staff to continue in an intelligent and systematic manner the work of gauging all streams of water supply and location of all sites suitable for reservoirs for the storage of water, initiated a number of years ago. Carried.

RESOLUTION NO. 5

Whereas, a Provincial University has now been established in Alberta; and

Whereas, ex-Premier Rutherford made the announcement, prior to his retirement, that a Provincial Agricultural College would be established in connection therewith; and

Whereas, the present Government of the province of Alberta has made no announcement in regard to the location of the proposed Agricultural College; and

Whereas, the far-reaching importance of agriculture under irrigation demands imperatively that proper attention be paid to this subject in the curriculum of any Agricultural College established in the province of Alberta; and

Whereas, such would be impossible unless the College Farm was so located as to facilitate demonstration work under irrigation, thus giving students an opportunity to study the practical side of the artificial application of water; and

Whereas, under the climatic conditions of the province of Alberta, agricultural demonstration work without the aid of irrigation may be successfully prosecuted in almost any portion of the province, thus making the location of the Agricultural College an immaterial one as regards the interests of non-irrigated lands; and

Whereas, the gravest objections also exist to the policy of associating too closely colleges solely devoted to agricultural education and universities devoted to general educational work.

Therefore be it resolved that this Convention emphatically places itself on record in favor of the policy of having the Provincial Agricultural College of Alberta disassociated entirely from the Provincial University and situated in a district where irrigation by gravity may be practised. Carried.

RESOLUTION NO. 6

Whereas, the conservation of water for irrigation purposes by companies and individuals as at present carried out does not admit of the whole available area in each district being brought under cultivation; and

Whereas, the conservation of water by the Government would be the means of developing such areas to the fullest extent, assure absolute permanency of supply and materially increase the security to bond holders,

Be it resolved that the Governments in which such districts exist be urgently requested to give the matter their serious consideration and to put such system into operation at the earliest possible date. Carried.

KEEP IT GOING

Just about this time a few hundred years ago London was busy being burnt; and perhaps that fact is sufficient excuse —if excuse be needed—for telling a story that is going the round of the fire brigades.

It happened in a little town where they have only an amateur fire brigade. A fire broke out, the brigade was hurriedly gathered together, and the heroic band dashed off to save the threatened property.

With singular inconsiderateness, another fire selected that precise moment to break out at the other end of the town.

"Hi, you're going the wrong way!" yelled somebody who had only heard of the second fire.

"No, Jones' farm is on fire!" called the captain, pulling up.

"But Brown's bookshop is on fire."

"All right," shouted the enthusiastic captain as they dashed off again; "we'll be back to Brown's fire in ten minutes. Keep it going!"

A man had a cow he called Zephyr;
He thought her an amiable hephyr.
  But when he drew near
  She kicked off his ear,
And now the old man is much dephyr.

First Land Show in New York

America's Agriculture in the Midst of Millions, Madison Square Garden, November 3 to 12, 1911

THE purpose of this exposition is to provide space to exhibit the products of American soil, to give the people of the farm and country as well as town and city dwellers a complete demonstration, with authoritative and graphic information, regarding land opportunities in America, and to depict the progress of American agriculture from prehistoric times of the Pueblos and cliff dwellers to the present-day methods of scientific soil cultivation.

FINEST GRAIN, APPLE AND POTATO SHOW OF THE WORLD

There will be demonstrations of agriculture as generally practised, illustrations of modern scientific farming, a showing of dry farming methods and agriculture under irrigation. Exhibits have been secured from (and including) Alaska to Florida and Mexico to Canada. The progressive states of America will show American staples from sugar cane and cotton to corn, and here will be seen the finest apple, potato and grain exhibits of the world.

EXHIBITS AND ILLUSTRATED LECTURES

Displays will be made by the leading railroads, the most progressive states, boards of trade and chambers of commerce, counties and cities, land and irrigation companies, as well as by farmers and orchardists. Five railroads whose terminals are on the Pacific will show exhibits from their territories. The New York Central, New England railroads, the Pennsylvania, Canadian Pacific, Great Northern, Northern Pacific, Chicago, Milwaukee and St. Paul and Puget Sound railways, the Southern, Norfolk and Western, Norfolk and Southern, the Orient and other roads have purchased space and will exploit the soil products of their territories.

In a lecture hall seating 1,100, directly opening upon the exposition hall, will be given entertaining, educational and popular lectures regarding agriculture, irrigation and dry farming methods and pointing out the location, advantages and opportunities of the new place, beckoning to and awaiting the idle yet willing man. These addresses will be given by lecturers of national reputation every hour of the day throughout the exposition and will be illustrated, motion picture machines and stereopticons being provided for the purpose.

OVER $11,000 IN AGRICULTURAL PRIZES

The handsomest and most valuable prizes for agricultural products and exhibits ever awarded are offered by this American Land and Irrigation Exposition. Experts of high reputation will be appointed by James Wilson, Secretary of Agriculture, to make the awards. Messrs. James J. Hill, Howard Elliot, Sir Thomas Shaughnessy, Colonel Robert M. Thompson, Horace Havemeyer, Adolphus Busch, A. E. Stilwell, Gustave Pabst, A. J. Earling, International Harvester Company, and P. L. Van Cleve have donated valuable prizes for staple products exhibited here, and the list of prizes and premiums amounts to over $11,000. Grand prizes are offered for wheat, oats, corn, cotton, barley, alfalfa, hops, sugar beets, potatoes, apples, etc.

"WIZARD" BURBANK'S EXHIBIT

The Luther Burbank exhibit from California will be shown for the first time in New York or the east, at this exposition. Luther Burbank is internationally famous as the "wizard of agriculture," and this first demonstration on the Atlantic seaboard of his productive methods and surprising creations in the plant world will prove to be a popular attraction. Here will be seen the Burbank "pomato," a cross between the potato and tomato; his white blackberries; the spineless cactus, and those berries whose flavor, in spite of the well-known bishop's assertion, surpass that of the strawberry.

MUSIC COSTING FORTY-ONE THOUSAND DOLLARS

Choral, band and orchestral music will be presented during the day and evening throughout the exposition, and one of America's greatest choruses (200 voices) will sing daily the prize "Ode to Irrigation," songs of the soil, state and national airs. This choral organization will come to the exposition at an expense of $40,000 and will be the strongest musical attraction ever presented at a band show. The chorus will give three programmes daily of popular and operatic music, as well as of music especially appropriate for the exposition.

THE CALL OF THE LAND

The exposition will illustrate that the prosaic earth produces crops, foods, raiment and homes, sustains life and makes cities possible, that real-estate is real worth, that growth increases land values. "Stocks" bloom, wither and die; commercial interests come and go; constituted amalgamated wealth of mighty empires may disappear, but the land remains for ever.

The American Land and Irrigation exposition will be attuned to voice the cry of "Back to the soil, the land, the home!" It will give illustrated information to the some seeker, the farmer, the railroad man, the investor, the student and to town and city dwellers regarding the development and colonization of the beckoning lands of the middle and far west, the Pacific slope, the south, the eastern and New England states.

It will put the man in the place; it will show the tiller of worn-out land how to rejuvenate his farm or where best to seek and find a virgin richer soil; it will turn tired toilers of the town to green fields and the song of the thrush; it will point the way for the immigrant and direct "the landless man to the manless land."

ONE MILLION IMMIGRANTS ENTER NEW YORK YEARLY

Of the 1,041,570 foreigners who entered America in 1910 as immigrants 896,000 of them landed at Battery Park, New York City.

Statistics furnished by the commissioner of immigration show that of this vast number several hundred thousand listed their previous occupations as farm laborers or farmers. But, strange to say, further statistics of the immigration office demonstrate that the agricultural states of America received of this number not more than 50,000 immigrants. Attracted by the high wage scale, 280,000 of these foreigners, a majority of whom came from the farms of Europe, remained in New York city to fight an unceasing battle for existence in the crowded city streets.

Investigations among the immigrants remaining in New York prove that a large percentage of these people took employment in the city through stress of circumstance and lack of information, although desirous of seeking labor on the American farms. Undoubtedly one of the most impelling reasons for this vast number of country-bred foreigners to remain in the city is the fact that there is in the metropolis of America no bureau of information regarding land, crops and farm labor. A few of the more progressive states which still have vacant lands for settlement maintain small bureaus of immigration and make a limited effort toward attracting the foreign countryman. Figures on the distribution of the immigrants, however, demonstrate that not more than one-tenth of the immigrants reaching the port of New York are distributed throughout the agricultural sections of the country by these bureaus.

This condition is a prime reason for holding a national land show in New York city. The American Land and Irrigation Exposition to be held in Madison Square Garden November 3 to 12 of the present year will give thousands of immigrants an opportunity to learn something of the agricultural resources and possibilities of America.

The results of this first land show should be such as to demonstrate the need of a permanent exhibition of American agriculture in New York city. An increased number of immigrants would thereby be induced to settle upon the soil and become producers instead of consumers.

While the call of the land in America is still insistent and to be heard from the north, west and south, the call for labor is more vociferous. Thousands and thousands of acres of manless land lie waiting to be taken up and cultivated, and these acres will produce not only an independent living, but fortunes for the pioneer who will first inhabit and work them.

The present-day concentration of people in the larger cities is a serious problem. It has much to do with the increased cost of living, and it seems that the agricultural states of America should combine in an effort to attract the immigrant landing in the country's metropolis to their broad and fertile acres, relieving urban congestion and increasing the number of producers.

LIST OF TROPHIES

Gold coin and solid silver prize cups to the value of $11,000 will be awarded for agricultural and horticultural products at the American Land and Irrigation Exposition to be held in Madison Square Garden, New York City, November 3 to 12, 1911. These valuable prizes are as follows:

$1,000 SILVER CUP FOR WHEAT

Donated by James J. Hill, chairman of the Great Northern Railway, for the best 100 pounds of wheat grown in the United States in 1911.

$1,000 IN GOLD FOR WHEAT

Donated by Sir Thomas Shaughnessy, president of the Canadian Pacific Railway, for the best 100 pounds of hard red wheat, spring or winter, grown on either continent of America during 1910 or 1911.

$1,000 SILVER CUP FOR CORN

Donated by the International Harvester Company of America for the best thirty ears of Indian corn of any variety grown in the United States in 1911.

$1,000 SILVER CUP FOR OATS

Donated by A. J. Earling, president of the Chicago, Milwaukee and St. Paul Railway, for the best 100 pounds of oats raised in the United States in 1911.

$1,000 SILVER CUP FOR COTTON

Donated by Colonel Robert M. Thompson, New York City, for the best short-staple cotton grown in the United States in 1911.

$1,000 SILVER CUP FOR POTATOES

Donated by A. E. Stilwell, president of the Kansas City, Mexico and Orient Railway, for best exhibit of marketable late potatoes grown in 1911.

$1,500 SILVER CUP FOR BARLEY

Donated by Colonel Gustav Pabst of Milwaukee for the best bushel of barley grown in the United States in 1911. Colonel Pabst will also purchase all the crop of the prize winner at a fancy price.

$1,000 SILVER CUP FOR SUGAR BEETS

Donated by Horace Havemeyer, Jr., New York City, for the best sugar beets grown in the United States in 1911.

$500 IN GOLD FOR APPLES

Donated by Howard Elliott, president of the Northern Pacific Railway, for the best twenty-five boxes of apples of any variety or varieties grown anywhere in the world.

$1,000 SILVER CUP FOR HOPS

Donated by Adolphus Busch, of St. Louis, for the best hops grown in the United States in 1911.

$1,000 SILVER CUP FOR ALFALFA

Donated by Paul L. Van Cleve, president of the Sweet Grass Land and Live Stock Company, Melville, Mont., to be awarded to the person demonstrating the best and widest uses of alfalfa as food for man and beast, who shall also exhibit at this exposition alfalfa meal or flour and bread and other products made therefrom.

Here is a chance for Canada to show the world what we can do in producing wheat and apples.

◆

"Pa," enquired William, "what is a burlesque?"

"A burlesque, son," replied the father, "is a take-off."

"Take off what?"

"Henry," interrupted the mother, who had been listening to the conversation, "if you are going to answer that question, I will leave the room."

Was the Old Farmer Right?

By PROFESSOR F. L. WILLIAMS

"HE is just like other young men of today; he is looking for a snap. When I was a young man the question was, 'Where can I earn something?' But now it is, 'Where can I find an easy job that goes with fine clothes and short hours?' No, sir, young men whose chief ambitions are to spend and be amused are not worth educating."

WAS VERY MUCH IN EARNEST

The speaker was an old farmer; I had been trying to persuade him to join forces with me in urging his youngest son to prepare for a course in the agricultural college. This son was the seventh child, and the only one remaining at home. When I had finished, the old farmer addressed me in the words beginning this article. No; he was not joking. He was very much in earnest. He prided himself on being broad and liberal-minded. Many of his faculties were keenly developed. He read much; perhaps too much. It is possible that the newspapers and periodicals which he read led him to believe that the spirit of graft not only dominated the great business corporations, public and private, but that the farmers and the farmers' sons, too, were rapidly swelling the unclean ranks of the moral lepers. If such was his viewpoint, no wonder he was in earnest.

KNOWLEDGE OF WICKEDNESS

But, was the old farmer right? Is it true that our young men are not willing to give value received; that they are trying to get something for nothing? Is it true that they see nothing better in life than fine clothes and idleness? Or, are there more instances of this kind today, in proportion to the population, than in former times? Perhaps he did not stop to think that there are now thousands of people to do things where there were only dozens when he was a young man; that the means and facilities for gathering the news and spreading it broadcast have been greatly improved; that the crimes and the foibles of the whole world are crowded into his morning paper! In the last respect, I believe the people of his boyhood days were better off than we are. Their knowledge of the world's wickedness was seldom more extensive than the neighborhood; ours is world-wide!

RASCALS ARE NOTHING NEW

Since the time our ancestors were expelled from the Garden of Delight there have been men who would rather run their toenails off trying to get something for nothing than to earn good wages at honest toil. From time immemorial there have been men who would rather try to live fashionably on starvation salaries than to earn five times as much in wages and wear the garb of a mechanic or tradesman. I know there are shiftless men and women, too, who want to get money without earning it. Whether the victims of heredity or environment, or of both, we are sorry for them all. Yet, comparing our present population with that of former times, I am confident that there are fewer people now trying to live by their wits than there were in bygone days. I do not question the sincerity of the old farmer, but it seems to me that we should ascend high above the level and take an extensive view before we make the application general. Even then the depth of the sweetness cannot be determined by the scum.

FUTILE SEARCH OF DIOGENES

In the days of Abraham they tried to find one good man in the great city of Sodom that the city might be spared, but—Sodom was destroyed. We find Diogenes carrying a lighted lantern in the daytime through the streets of Athens, seeking an honest man, but his search was not rewarded. About four score years ago a young clerk in a country store in Illinois dealt fairly with an old lady and at once became a marked man; that act, no doubt, helped to win him the title "Honest Abe." On the other hand, a paying teller in one of the Walla Walla banks, by mistake paid out to a young farmer, one busy day last harvest, a fifty instead of a five dollar bill; the extra money was returned the next day, but the newspapers said nothing about it. Honesty is too common in that city to come under the head of news. Nor do I think the result would have been different had the young man been a merchant's clerk!

WHAT ARE WE DOING?

After all, it is of little consequence to say that we are sorry for the shifty and the shiftless, or that we believe the world to be better than it was in the good old times we read about. The important question is, What are we doing to make the world better? I have often heard my old farmer friend say that he wanted to leave the world a little better because he had lived in it. When he comes to take the final look over his life's work, I hope that he may feel the joy that comes only to those who have realized a noble ambition. He has set his children a good example in industry and honesty; he has spoken a great many kind and helpful words; he has practised the "square deal" in poverty and in prosperity; he has lived a manly, upright life; and he is honored and respected by all his neighbors worthy of the name. We may pat him on the back, or give him tokens showing our respect, but we must not try to make him believe that he is the only good fellow left in the world, and that there will never be any more honest men after he is gone. There are millions of honest, industrious, intelligent men and women, nor are they all of the grandfather vintage.

Yes, there are good men and true in every community, rural and municipal, but the question that should concern us most is, Are we in that class? Will the world be better by our living in it? Can we answer that question satisfactorily? Are you "priest," "Levite" or "Good Samaritan?" Are you looking upon the bright side of life; talking about the things that lead men up toward the light; lending freely the helping hand to those in distress?

TO BE A GOOD FARMER

It means more to be a good farmer today than it did 30 or 40 years ago. To be a good farmer now does not mean merely giving full weight, full measure and good quality when he comes to sell his farm products. Our good farmer must be true, helpful and loving in his home life. He must study and plan to make home conditions more healthful, more comfortable and more attractive. He must keep a watchful eye and a steady hand on everything that pertains to good citizenship and civic progress. In short, he must put body, soul and spirit into this matter of better living. What I have said with regard to the farmer is not limited to the farmer. It is applicable to every walk of life. If we are not doing our very best day by day to make the world better, then the old farmer has sent us a message, and now is the best time to settle it fairly and honestly.

WHICH PEARL?

A group of actors were sitting in the smoke-room of a provincial hotel.

The little waitress who brought their drinks was particularly pretty, and some of the younger men chaffed her a good deal about the rosiness of her cheeks and the goldiness of her hair, casting doubts on their being true to Nature.

"What is your name?" one of them asked.

"Pearl," she replied, flushing a little.

"Pearl!" repeated the actor, "what a pretty name. Are you the pearl of great price?"

The waitress' temper was beginning to slip its moorings by this time.

"No," she replied tartly; "at present I'm the pearl before swine!"

Proper Supply of Humus

Green Manuring Will Bring Best Results

THE question of a proper supply of humus is of general interest. Of all the various soil ingredients, I believe that humus occupies a place fully as important as the various plant foods. As a means of controlling the physical condition of the soil, humus stands pre-eminently first.

In order to refresh the subject, it may be well to say that by "humus" is meant the vegetable and animal matter in the soil which is in a transitory stage of decay, the process having proceeded far enough to cause the material to lose all resemblance to its original condition, and yet not far enough to become the final ash. It is the brownish, spongy material of the soil, which assumes a dark color when wet, and thereby gives the dark tints to moist soil.

The functions of humus in the soil are many. Humus can modify the physical condition of a soil to a marked extent. It makes soils more friable by holding the rock particles in such a way that heavy soils do not tend to run together, bake, pack, or crack. With lighter soils the rock particles do not fall apart as readily. In both humus increases the chances for soil aeration, water absorption and moisture retention to a marked degree. The land can be handled much easier and will work down into vastly better shape with a lessening of the dangers of too much packing or too great openness. Humus is the element which gives the name of "loam" to soils. A "sandy loam" or a "clay loam" means a soil of sand particles and aid in liberating phosphoric acid and potash, plentifully supplied with it. And loamy soils are notorious for their easy working and big yields.

Chemically, humus plays an important part in liberating plant foods. The mass of green stuff or manure which is the primary source of the humus furnishes food for the myriads of soil bacteria. These bacteria attack the mass of material and, with fungi, are instrumental in bringing about the decay. In feeding upon the material these agencies secrete acids which in turn attack the soil particles and aid in liberating phosphoric acid and potash. From the decaying material comes nitrogen, especially if the original green manure crop was of a leguminous nature. The different processes which take place are complex and in many instances are but imperfectly understood. One set of reactions may so cloud others that investigations are obscured, and, at best, we can judge only by deductions as to the processes which are under way. While this may be interesting chemically, from the agricultural standpoint it is sufficient to know that agencies are present which can do the work once the material is supplied for them to feed upon and convert. The problem, then, consists in deciding upon the method which will prove most economical and quickest for putting humus into the soil, whether the aim be to increase the present supply of humus or merely to maintain a constant supply.

The need of humus can be determined in the field by noting the action of the soil when drying as regards baking, cracking or packing. Under the magnifying glass or microscope samples of soils from fields lacking humus will show the definite angular particles of rock which constitute the soil without the accompanying little irregular, textureless masses of decaying vegetable matter—the spongy humus.

Chemically the lack of humus can be shown by taking representative samples of the field in question and employing the humus test as outlined in the appendix of Hilgard's book, "Soils." Samples for this work should be very carefully taken by scraping off the surface vegetation with a shovel at the spot to be sampled, and then selecting typical samples of soil for each foot of the first three feet in depth. A soil augur or a post hole digger will facilitate sampling. Sufficient samples should be taken to denote as accurately as possible the existing conditions. When the soil is of the same general nature, samples at intervals of 500 or 1,000 feet will do for large tracts, although closer sampling is better. Should too great an outlay of work present itself in making the tests —although these are easy and quick to run—several samples from the same depth, same fields, and same character of soil can be mixed together and tested as a compromise.

To run the tests the soil is pulverized and passed through a half millimetre sieve. Seven grams of soil are then placed in a test tube, with 15 or 20 cubic centimetres of a 10 per cent. solution of caustic potash and boiled 10 or 15 seconds. The sediment is allowed to settle, and the resulting color of the liquid is then used as a measure of the adequacy or inadequacy of the humus content. A black, non-translucent solution shows at least 1 per cent. of humus —an ample amount; a deep brown color indicates about ½ per cent.; a light brown less than ½ per cent., and indicates a need of humus.

Reclaimed arid or semi-arid lands which have been given much summer fallow, and old grain fields are very apt to be low in humus. The conditions under which they lie and the methods pursued in cultivating them tended to burn out the humus.

To properly replace humus in worn-out lands is a matter which will require several years to fulfil. Even when once put back, the future aim should be to so regulate the farming scheme that provision for a renewal of humus from time to time will be made. In lands naturally rich in humus a scheme involving a green manure crop should be worked out in order to maintain the humus content at the maximum.

Green manuring, as the latter method is called, will offer the best results for the majority of cases, especially as lands low in humus content are also, as a rule, low in nitrogen. By growing a legume for green manuring the needed nitrogen can be secured from the air during the growth of the legume, and when the crop is turned under this nitrogen will be liberated in time for the needs of the succeeding crop. Because of the nitrogen-gathering faculty leguminous crops are to be preferred for green manuring. Common or hairy vetch, Canadian field peas, horse beans, velvet beans, alfalfa, the clovers, white, burr, crimson and alsike and lupines are examples of legumes. Which shall be selected depends on the adaptability of the section for the growth of the plant, the time of year the plant is to be grown and the place of the crop in the rotation. The aim is to get as great a growth as possible for turning under. Although the nitrogen-gathering capacity varies for the different legumes, this factor will play but little influence in determining the crop to grow. The best one is that which will furnish the greatest amount of green material for turning under. Perhaps the plants may fail to develop the nitrogen facilities. Whether this is so or not can be determined by carefully digging up a few plants from different parts of the field, gently washing the soil from the roots, especially from the tiny rootlets, and examining them for swellings or nodules. These indicate the presence of the bacteria, which, using the legume as a host, possesses the power of collecting and storing up the nitrogen. Legumes which possess these bacteria grow with a stocky, regular, firm, healthy growth, provided other conditions are favorable.

The place of the green manure crop in the rotation will depend upon the necessity for immediately supplying humus and the climatic conditions. In the semi-arid or arid countries it is usually possible to grow a crop between the beet crops by utilizing the irrigation water, and sowing the green manure crop as soon as the land can be put into shape after the beets are removed. Under other conditions where fall-sown grain is used in connection with the beet crop, a green manure crop can follow the grain and be turned under in time to prepare the land for the next beet crop. In humid sections having cold winters such schemes may not work. It is then necessary to depend on an early fall crop, or else reserve a year especially for the green manure crop. Should the lack of humus be great enough it will pay to follow the same policy in other sections, that is, to make provision for an immediate green manure crop during the most favorable growing season, even though in the future fall green manure crops can be relied upon. Usually, however, a smaller yield from the green manure crop, repeated often, will prove superior to a very heavy growth at longer intervals. For one thing, less time will be required for the material to rot. If the rotation consists of grain, beans, beets, and beets and winter crops are possible, the green manure crop can then follow the grain and possibly the beans.

The amount of green stuff in a green manure crop is immense. A fall crop of Canadian field peas, poor stand with 15 in. tops and 12 in. roots, gave 1,300 lbs. of tops and 10,000 lbs. of roots for plowing under in time for spring beets. Under the same conditions alfalfa made a growth of 6 in. tops and 5 in. roots, giving 5,000 lbs. of tops and 16,000 lbs. of roots. Common vetch with 12 in. tops and 8 in. roots produced 13,000 lbs. of tops and 48,000 lbs. of roots. These were green weight, of course.

In choosing the green manure crop the question of available water for both growing and rotting the crop is important. All crops need water to aid in decay, and if the supply which will fall or which can be turned on at the time the stuff is plowed under is small, the aim should be to produce a growth of fine textured stuff rather than coarse, heavy, fibrous material, although when conditions are right the latter will produce the most humus. When small crops must be grown the return of sufficient humus to the soil may be delayed. If such are the conditions, the plan should include repeated crops.

In plowing under, the crop should be placed as deep down in the soil as possible. It is easy enough to work the material up from the bottom of the plow furrow, once it is placed there. The deeper the crop is put down the greater the body of soil which is benefited physically and chemically from the green manure crop. This means an actual increase of tillable land. Some difficulty may be experienced in turning under the growth. By using chains on the plows, or even by dragging or ring-rolling the growth before plowing, the work will be greatly facilitated. A sharp knife or disc coulter will greatly aid in permitting clean, thorough work.

The first cost of a green manure crop may appear prohibitive at first glance, but a number of factors enter in which go far to offset this cost. Often the irrigation for the green manure crop will also suffice for the fall or winter irrigation for the beet crop. Certainly an irrigation put on to rot the plowed-under crop will do double duty in this respect The final plowing can often serve for the best crop as well. At the same time, the constant working of the land increases its efficiency, while the addition of humus is bound to react in a future saving of expense necessary for putting the land into required shape, and at the same time the life of the land is prolonged physically and chemically.—R. L. Adams, in American Sugar Industry and Beet Sugar Gazette.

PICKING UP APPLES

A greengrocer with a basket of apples on his head met with an accident and upset the lot. He was an eccentric person, and when he commenced to pick the apples up in couples and found there was one over, he dropped them again and proceeded to pick them up in threes.

However, even now he was left with one at the end, so in turn he tried picking them up in fours, fives and sixes with no happier result.

He tried picking them up in sevens, and found at last that there were none over.

How many apples were there in the basket?

(Answer to this will appear in November number.)

Cancer in Plants

THE Nova Scotia Department of Agriculture has in the press a bulletin entitled "Crown Gall: Its Cause and Remedy," which promises not only to revolutionize present views respecting the nature of various overgrowths in plants, but also to throw light on the cancer problem in men and animals.

This bulletin deals with a widely distributed and harmful disease of orchard trees and other plants. This disease is commonly known in the United States as crown gall, but it may occur not only on the crown of plants, but on roots and shoots.

The disease has been known for a long time, and under the supposition that it was infectious and injurious, various states have made quarantine laws against it. The disease has been ascribed to various causes, without satisfactory proof, and many persons have been led to believe that it was not due to any organism. The experiments detailed in the bulletin show clearly that the gall is due to bacteria and is infectious, being readily transmitted not only from plant to plant of the same kind, but also to many plants of widely different families. The bulletin shows that the growth is not only of itself injurious to the plant, but also may form an open wound through which other parasites are likely to enter, such as the fungus of root rot, and the bacteria which cause blight of apples and pears.

The bulletin recommends that the inspection laws now in force in the various states be continued and enforced. It shows what plants it is not advisable to use as a crop following a galled one. It describes the life history and cultural characters of the organism involved, points out the difficulties through which it was isolated and identified, gives numerous illustrations showing the nature of the tumors produced and the time involved in their production when pure cultures of the organism were used, shows that the organism has a wide range of host plants, and that the overgrowths produced are in many ways anatomically and otherwise strikingly like those found in certain malignant tumors.

The cause of cancer is unknown, and a majority of animal pathologists at the present time are inclined to regard it as non-parasitic, chiefly, however, because no parasite has been found. The bulletin shows that a similar argument might have been advanced with equal force some years ago against the parasitic nature of crown gall. No good reason can be adduced why cancers should not occur in plants as well as in animals, and if these plant growths are truly cancers, then it is extremely probable that micro-organisms of some sort are also the inciting cause of sarcoma and carcinoma. Tubercule diseases occur in plants as well as in animals, and superficially they resemble these growths, but not structurally nor in the groupings of the parasite.

The bacteria causing these plant tumors are not abundant in the tissues, sometimes very rare; are hard to see and difficult to stain; they perish readily both in the tumor and in culture-media; are difficult to cultivate from the tissues unless one knows the technique; do not form abscess cavities after the manner of the tubercule diseases, but multiply in limited number within the tissues and apparently only inside the cells which their presence stimulates into rapid division. The disease metastasizes readily, and on this account is cut out with difficulty. The organism loses virulence easily both inside the tumors and in culture media, and finally if the plants are not destroyed by it they seem to acquire a partial or complete immunity.

The bulletin should not only be of very great importance to the orchardist and grower of hothouse plants, but also to all specialists who are interested in the cancer problem, inasmuch as in the present uncertain state of research on that disease any clue whatsoever becomes of importance. It is not claimed that the organism here described is itself the cause of malignant animal tumors, but only that in many respects the growths produced by it are suggestive of malignant animal tumors, and that probably some similar parasite lies at the bottom of the malignant phenomena of such growths. The bulletin involves team work done by four people in the Department of Agriculture, covering a period of six years and the total number of experiments involved amounts to thousands.

Canada's Riches

An Unbiassed View from New York

MR. THOMAS S. SHOTWELL, financial editor of the New York American, writes as follows in that journal:

"Since it is unfashionable and unpopular to believe in one's own country at present, those patriots who do not care to join in denouncing it may find something to interest them in the way Canada is growing at the expense of the United States. Last year about 90,000 farmers crossed the border from the United States into the Canadian northwest, taking with them perhaps $100,000,000, which they invested in wheat lands. Canada expects 150,000 with $150,000,000 this year for investment in her virgin territory. This will be accomplished with the aid of the American railways when they increase the freight rates after they advance the wages of their employees. Canada has no Sherman anti-trust law, no over-capitalized railroads, and it is not considered a crime in Canada to be prosperous.

"Canada persists in aggravating the troubles of the United States, and the latest act of the Dominion in permitting the discovery of gold in large quantities is unpardonable. In defiance of the fact that prices have advanced sharply in the United States (the same as everywhere else) as the result of congestion of population in the cities and the town, Canadian miners have had the impudence to discover in the Porcupine district of Ontario veins of quartz shot with free gold, and fifty or sixty feet wide.

"When Cobalt was discovered six years ago everybody laughed at the idea of Ontario becoming a silver producer, but Cobalt last year sold its silver product for $15,000,000 in gold, and on top of that comes the Porcupine discoveries.

GREAT COPPER PROJECT

"Canada is also joining Alaska in making the proposed copper trust look like a bad dream. Not satisfied with the great cliffs of fifteen and twenty-five per cent. copper ore that the Guggenheims have in Alaska (and that they have not announced as part of the copper merger), it now develops that Daniel D. Mann, who, with Sir James Shaughnessy, shares the honor of being among the greatest railroad promoters of the world, is developing on Portland Canal, in British Columbia, a great copper district that bids fair to cast Montana and Arizona in the shade. Deposits of ore have been discovered near Portland Canal averaging 15 per cent. copper and $7 in gold to the ton.

"A great smelter has been planned to take care of this ore and lead has been discovered within smelting distance. Mr. Mann is pushing a branch of the Canadian Northern railroad from Portland Canal into the new copper region. So quietly has this been done, and so utterly has J. P. Morgan been ignored in the matter, that rails for the new road are already on the high seas en route from Nova Scotia to Portland Canal by way of the Horn. This is the first public announcement ever made of the ore discoveries.

A FINE OUTLOOK

"Just south of the mineral deposits is a tract of the richest agricultural land in the world. For all of which the proposed new copper trust must hold the Canadians directly responsible—the Canadians and the bargain hunters.

"All this activity in copper means a tremendous boom for steel companies because the cost of copper is about one-twelfth of the total cost of electrification, most of the money going for steel and iron. Anyone who believes in copper stocks must believe in steel at least ten times as much.

"While considering Canada it may be well to call attention to the fact that wheat is selling above $1.10 a bushel in Chicago, following the greatest wheat crop the world has ever known. Consumption of wheat has overtaken production. The surplus is already eaten up. If people are going to quit eating meat they will have to eat more grain. This will mean a reduced consumption of corn, because most of the corn is eaten in the shape of meat."

Picture of the English Masses

By J. A. MACDONALD, Editor of the "Toronto Globe"

FRANKLY, the thing that impressed me most (in Britain), the thing that stands out as the background of every reminiscence, was the bloodless, mirthless, hopeless face of the common crowd.

Nothing seems able to dim or wipe out or soften the hard lines of that impression. The dress receptions, the gorgeous pageants, the galleries, the colleges, the storied castles, and all that rare procession of beauty and wonder and worth may fade into a dreamlike memory, but the pale and sunken faces of the nameless city crowd haunt one like a weird dream. We were given, as had been promised beforehand, rare and illuminating glimpses of "Britain at work and at play," but we could not shut our eyes or steel our hearts to that Britain which is out of work, which may not even want to work, and which has long forgotten how to play.

At first London seemed less hopeless than it was twenty years ago. Nowhere had civic improvement shown more signs of headway. The running of great new arteries, like the Kingsway, through congested areas had changed for the better some localities. Even East London, on a fair day, seemed less damning than of old. The spirit of reform is plainly at work, both in civic circles and among the captains of industrial life.

But the social problem everywhere is appalling almost to the point of despair. Wherever we went, it forced itself upon us. The least dangerous aspect of it was that hollow-eyed procession of the homeless of London, kept moving along the pavements by the police in the early dawn, waiting for the opening of the soup kitchens. London, Sheffield, Manchester, Glasgow, Edinburgh—each had its distinctive features, but everywhere the marks were deep of disease and degeneracy in body and mind and morals.

In some of the smaller places where the industrial percentage is large or the occupation unhealthy—as in the Black Country or the pottery-making communities—the blood-poisoned workers present an appearance that to unaccustomed eyes is simply ghastly.

In places like Portsmouth, where we drove through the streets after viewing the greatest array of warships ever presented in the whole world's history, the human sediment that littered the doorways and lanes crowded out of mind all thought of Britain's glory. It was hard to exult over the spectacular realism of the sham fight on the shore with those haggard skeletons of life's real conflict shuffling before our eyes uncheered and uncheering on the street.

Sheffield staggered all the delegates. Its residential districts and its neighboring hills are good to see. It is a hive of industry. Its name the world over is a warrant for good steel. But its human specimens! The conditions of the poor may, perhaps, be worse in other industrial centres in England, but certainly no delegate to the Imperial Press Conference has ever seen the like in any white country overseas or even imagined it possible within the limits of human nature.

We had been at the great gun works. We had seen the making of armor-plate and of cannon. It was all wonderful. Then our procession of motor cars wound slowly, and with many blockades through the narrow, crowded streets to the type foundry whence come the fonts that furnish the printing offices of the world. The finished product of the machines everywhere was perfect. The human product alone was marvel.

It was not that the people were poor. It was not even that they were hungry. Poverty and hunger are curable conditions. What struck every observant delegate was the utter blankness of the faces that looked up at us from the pavement, or down on us from the windows, with scarcely enough capacity for human interest to wonder who we were or what we wanted. Block after block it was the same. Never a sign of humor. Never even a flash of human envy. Stooped shoulders, hollow chests, ash-colored faces, lightless eyes, and, ghastliest of all, loose-set mouths with bloodless gums, and only here and there a useful tooth.

Literally hundreds of women between seventeen and seventy crowded close to our motor cars that day, and the marks were on them all. Those toothless mouths of men and women and children told the story. One touch of disease made that whole crowd kin. "What do you think of it?" asked a London reporter of a Canadian editor. "It's hell," said the Canadian. And his companion from Australia could not suggest any other fitting word.

Not that any district in Sheffield is worse or more depressing than the West Ham district of London, the High street district of Edinburgh, or corresponding districts in and about Manchester or Birmingham or Glasgow. Not that any one city has warrant for casting stones at any other city in the matter of neglect of the social problem.

Wherever we were close enough to the facts to see the details without having our sensibilities dulled, the impression was essentially the same; the haunting impression of misery sodden with drink and without ambition for better things. One of the attendant tragedies was the way in which even the very worst conditions were accepted as inevitable or acquiesced in as a matter of course.

Certainly there were bright spots and splendid signs of hopeful discontent. Churches, benevolent institutions and a myriad of agencies of reform were found at work. But they did not seem to make much headway. If they kept pace with the downgrade movements they did not fail. The influences making for decay were so many and so strong that the "uplift" agencies were everywhere overtaxed.

The thing that impressed me most hopefully was the growing recognition on the part of the strong of a real responsibility, personal and national, for those who are weak. With this is joined a growing tendency to go back to the causes of these desperate results.

Original sin and total depravity no longer explain adequately and finally the social problem. Other terms are used. "Land laws" and "liquor laws" are the modern phraseology. The social reformers are making the public understand that the poor people cannot, with safety to the nation, be crowded out of the open country where their forefathers tilled the soil, and huddled together in disease-rotted tenements where they breed and fester in crime and plague.

The civic authorities are being taught that a running social sore in the downtown tenement is a menace to the people in the uptown villa. Even the evangelists and missionaries of religion have come to see that "free" service and "free" breakfasts are only makeshifts so long as the diseased and the unfit go on multiplying themselves in squalor and crime. Fresh air and honest work are called for. The objective of it all is "back to the land." Then you get into the politics of the problem.

At the heart of the wretchedness and poverty and disease of the British slum is the drunkenness of the people. To a Canadian nothing is more shocking than a look into the typical public-house, with its motley crowd of men and women in various stages of intoxicated imbecility. And the children! They are cursed before they are born. And while they are yet infants they are doomed to drink and crime. One despairs even of the children, so scarred and ingrained are their whole natures with the diseased conditions which destroy alike nerve and brain and blood.

Some of the social reformers talk of Canada as the hope of the slum children. It offers at least a chance.

But quite plainly Britain must do something more and something else with her social problem than to go on generation after generation multiplying the unfit and transporting them to the overseas dominions. The open country and the cleaner social conditions of Canada may redeem a few of the least hopeless.

But why not try the open country of Britain itself? One sees simply millions of acres of untilled land in England and Scotland, the unused areas of great estates. Why not reclaim that land from the pheasants and the deer?

And why not do something more to clean up Britain's social life? Why should the public-house and the brewery go on dominating the legislation and the social institutions of a free people?

In the "historic mile" of Edinburgh, between the Castle and Holyrood, there are more liquor-selling places, more and filthier, than in the whole city of Toronto. And Edinburgh is not worse than Glasgow or the large cities of England.

How long will a great nation go on breeding weaklings and criminals? How long will such a nation remain great? And how long will it be counted safe for Canada to admit the human outfit of Britain's drink-cursed slums? But all this may be a matter of politics.

Yet when he shoots at woman's heart,
'Tis then he makes the Mrs.

Yet when he shoots at woman's heart,
'Tis then he makes the Mrs.

USE OF ALUM AND SODA

FOR mending broken china or glassware, use melted alum while hot.

Sprinkle powdered alum among and in furs before putting them away for summer; also under edges of carpets for prevention of moth.

In case of croup, beat white of egg to stiff froth, add a little sugar, one-fourth teaspoonful of powdered alum, and give one-half teaspoonful every 15 minutes until relieved.

Spreading same mixture on cloth and laying on eyes will extract foreign substance.

To set color in light shades of pink and blue, soak goods in salt water, to which has been added good-sized lump of alum. In violet and lilac, use alum and water without salt. After color is set, wash in borax water.

For tender feet bathe in strong solution of alum and boric acid.

Same rubbed on feet and allowed to dry will remove odor.

Powdered alum applied to cut will stop bleeding.

To prevent grease deposits from forming in sink drains, pour down the drains two or three times a week boiling water to which soda has been added.

To remove tarnish from silverware dip the silver first into a vessel containing a strong solution of soda and water, boiling hot, then rinse in clear boiling water and dry with a clean, soft cloth.

Soda added to dishwater will save soap and brighten the dishes.

To remove the tannin or brown stain found in teapots, boil soda water in them for a short time, then wash, rubbing them with a cloth, and the stain will all come off.

Add a pinch of soda to the first water in which beans are cooked and much less time will be required in cooking.—New York Times.

Peter (sent for the milk): "Oh, mercy! I've drunk too much of it! What shall we do?"

Small Brother: "That's easy! We'll drop the jug."

Pollination of Fruits

MORE than 100 years ago (about 1793) the German botanist, Sprengel, published a book in which he showed as a result of his observations the part insects play in the pollination of flowers. This work, many statements of which have been disputed, proved a stimulus for further work and observations in pollination of fruits. Sprengel himself probably did not understand how important cross-pollination is in nature.

Later, Andrew Knight, in England, carried on experiments in cross and self-fertilization of the pea, which showed that it was probably intended in nature that plants should be cross-fertilized.

Darwin was the first to establish clearly the true value of cross and show the interesting modifications of plants to aid in cross-pollination. In Darwin's "Origin of Species," cross-fertilization is especially emphasized. But it was not until some time later that much attention was paid to his theories.

M. B. Waite, of the Department of Agriculture, Washington, conducted some very valuable work with apples and pears about twelve years ago. Since that time many experiment stations and a few individuals have made systematic studies of this and many other plant-breeding problems.

Many plants are sterile, as far as their own pollen is concerned, but will readily respond to pollen from other plants. Some fifty plants are known to be thus self-sterile, but they will bear fruit if pollenized with pollen from other plants. C. I. Lewis, of the Oregon Experiment Station, Corvallis, Ore., has found that out of eighty-seven varieties of apples worked with, fifty-nine varieties were self-fertile, fifteen self-sterile, and thirteen varieties partially self-fertile.

Many varieties naturally tend to be sterile when limited to their own pollen and a knowledge of these is important in pollination work. A sterile variety is one that will not fertilize its ovule with its own pollen; the pollen of a fertile variety will do this. Investigators have found that climatic conditions affect the sterility and fertility of varieties, so that tests must be made in different climates.

The method employed to test this is to enclose the blossoms in Manila bags before they open, thus preventing any outside pollen from entering the flowers; and if the blossoms fail to set fruit after the pollen has been distributed on the stigmas, the flowers are said to be self-sterile.

Among self-sterile varieties of apples, according to Lewis, are Early Strawberry, Gravenstein, Haas, Jonathan, McMahon White, Pewaukee, Rome Beauty, Salome, Tolman, Sweet Transcendent Crab, Wealthy and York Imperial.

Self-fertile: Baldwin, Grimes Golden, Duchess, Scott's Winter, Shiawassee and Yellow Newtown.

Partly self-fertile: Ben Davis, Whitney and Yellow Transparent.

It has been found that certain varieties make better pollenizers of varieties than others. For example, better results were obtained by crossing Spitzenberg with either Jonathan or Baldwin than with Newtown, and very much better than when self-pollenized. In determining the pollenizers for any variety, we must choose those that blossom at the same time as the one to be pollenized, and they should bear a large quantity of pollen, although it is not essential.

In planting an orchard, it is well to set alternately about two rows of a variety that is weak in pollen, and then two rows of one strong in pollen, etc. They must be close enough so that insects will visit each easily. Wind has been found to be a poor conductor of orchard pollen.

The floral envelopes of flowers tend to attract bees and insects, but they quite readily visit flowers not having conspicuous floral envelopes or where the envelopes are gone.

Climatic conditions have considerable influence on the blooming periods of fruits. In cold, frosty localities, varieties should be selected in reference to their blooming periods, and success will more often result.

The length of time that pollen will keep varies. It may safely be kept two or three weeks, and even longer if not allowed to ferment.

In the work of cross-pollenizing at Corvallis, it was shown that immediate effects of pollen on color of fruit were seen. Also the crossed apples were heavier, and the seed was also heavier. Many of the self-sterile varieties when self-pollenated were found to be seedless or had small seeds. When the self-fertile varieties were cross-pollenized, an improvement in size was noted.—*Southern Fruit Grower.*

A New Spray Mixture

IN the course of some experiments with the addition of lead arsenate to lime-sulphur compound, it occurred to me that quite probably the reason for the inefficiency of lime-sulphur alone and its increased efficiency when lead arsenate is added, is simply that the precipitate formed by the addition of lead arsenate, being insoluble in the rains and dew and being more stable than lime-sulphur compound alone, acts to increase the sticking power of the spray mixture. This led me to wonder if there might not be some other substance than lead arsenate which could be added to the lime-sulphur compound to form a colloidal precipitate. That is to say, a precipitate that would remain in suspension well and would stick to the foliage as it dries and form a film over the surface of the leaves, rather than simply a dust-like coating. It is this peculiar property that gives Bordeaux mixture its great value as a fungicide. If such a substance could be found it might be possible to make lime-sulphur as efficient as Bordeaux mixture in spraying for blotch and bitter rot. After canvassing a great number of possible sulphur compounds, with the intention of making a colloidal precipitate from the lime-sulphur, and then adding an insecticide to make the complete fungicidal and insecticidal mixture necessary for apple spraying, it finally occurred to me that arsenic itself was the substance I had been seeking.

Arsenic forms a colloidal precipitate with sulphur, which, if it can be made in the right proportions, will remain in suspension for a long time, and on drying will adhere well. This substance should be poisonous to both fungi and insects, as both the arsenic and the sulphur are in chemical conditions which have been found in other compounds to be poisonous, each in its way, to insects and fungi. If we accept this much, then the problem becomes one of finding the right proportions and of getting the arsenic in solution in proper form to combine with the sulphur. Preliminary experiments so far have shown two strengths of mixture which seem promising. One of these contains arsenic in about the same amount as when used in the ordinary way as lead arsenate. It forms an orange yellow, light, feathery precipitate which remains in suspension well and adheres well. This strength has been tried in a small way three times on apple and peach trees, and produced only a very small amount of injury on peach leaves one time when applied in a drizzling rain. There was no injury on apples in either wet or dry weather. The other formula contains much more arsenic and forms a much heavier, light yellow precipitate, which has rather more of a tendency to settle. This has been tried on peach and apple trees only once in fair weather, and has produced some injury.

Extensive experiments will be necessary to determine whether either of these mixtures is effective in controlling fungus and insect pests, and to find under what conditions, if any, injury is to be expected on the foliage and fruit.

I propose to give one of these tentative formulae and ask some of the "Fruit-grower" readers to try it out in a small way, upon only one tree in any variety, and to report their experience to me. It will be better to choose trees that are known to bitter rot or blotch badly, and see at the same time if the application shows any promise of giving relief from these diseases as compared with check trees of the same varieties which have not been sprayed. I should like also to have the trees compared with others which have been sprayed with Bordeaux mixture and other spray mixtures, wherever such is possible. It is our intention next season to perform a series of experiments in spraying for scab, blotch, bitter rot, codlin moth and curculio, the last one on both apple and peach, and also for brown rot of the peach.

Any data that can be had in the meantime will greatly aid in making plans for these experiments.

The formula that seems most promising calls for one-fourth pound of white arsenic, three-eighths pound of common concentrated lye, and two gallons of lime-sulphur compound to a barrel of spray mixture. A stock solution of arsenic and lye should be made as follows: Dissolve two pounds of good concentrated lye in five gallons of water. Mix one and one-fourth pounds of white arsenic with a little water to make a paste and add to the lye solution. Stir this well and it will dissolve in a few minutes. To make the spray mixture put one gallon of this stock solution into a barrel or tank. Make up to 50 gallons of water and add two gallons of lime-sulphur compound, which will test 33 degrees Beaume. Stir the mixture well for a half minute or less, and do not agitate it while spraying.

The white arsenic used in this formula does not burn the foliage, because there is an excess of sulphur in the lime-sulphur compound which combines with all of the arsenic, leaving no free soluble arsenic to cause injury.

I shall be especially well pleased to hear from anyone who will experiment with this spray material, and will be glad to have you report on the following points: Variety, age of trees, diseases, dates of spraying and weather, brand of lye, brand of lime-sulphur; did the mixture stay in suspension and adhere well? Does the tree sprayed with this mixture have much leaf spot injury? Per cent. of fruit, sound, injured and culls. How does the tree sprayed with this mixture compare with other materials you used this year?—*J. Lee Hewitt, in "St. Joseph Fruit-grower."*

TOPPING HIGH TREES

If apple, pear and peach trees are inclined to run up too high, they must be headed back. I have not recommended the heading back of cherry trees for what seems to me to be a very good reason. My advice on pruning the cherry tree has been to do your pruning during the first two or three years it is set in the orchard, and then after that let it alone. Experience has proven that heavy cutting on cherry trees will greatly damage them and perhaps kill them. The sour cherry trees (*Prunus cereasus*) do not incline to run up very high, hence do not need any topping to keep them low. But the sweet cherry trees (*Prunus avium*) tend upward and frequently become very tall. Keep them headed back when young, but after that let them alone. It is true that it becomes a difficult job to get all the cherries, but better lose a few cherries on the tips of the limbs than to lose the whole tree. With our modern system of ladders, it is wonderful how well we can get up to these highest cherries. We have on our fruit ranch some Black Republican, Royal Anne, Olivett, Bing and Lambert cherry trees that are very tall, and yet we get the most of these cherries. We have some Late Duke cherry trees that are quite tall, although not so tall as the sweet cherries named above. The Dukes are midway between the sour and the sweet cherries, so far as height is concerned. Pear trees may be safely headed back, but I would keep them low when young.—*F. Walden, in the "Ranch."*

She: "I'm sorry I ever married you."
He: "You ought to be. You did some nice girl out of a good husband."

Fruit and Vegetable Market

UNDER date of September 19, Mr. J. C. Metcalfe, B. C. Markets Commissioner, reports from the prairie provinces as follows:

The McPherson Fruit Co. at Calgary report having handled 10 carloads of peaches. Report buying peaches at 40c and 45c per box, f.o.b. point of shipment. Crabs, Montana, $1. Prunes, in peach boxes, 60c; 4-basket crate, 70c. Washington apples, $1 to $1.25.

The Acme Fruit Co., jobbers, report four carloads from the Okanagan Fruit Union, Vernon. Report it fine stock, and further added they were highly pleased with stock received to date in every respect. They are also receiving Nova Scotia Gravenstein apples. All jobbers in Calgary are receiving them, and some of the large retailers. Jobbers at present receiving two to three carloads each. Prices for Nova Scotia Gravenstein and other fall varieties from there are being quoted lower than formerly, as quotations indicate further on in this report.

The Vernon Fruit Co., at Calgary, report a car of mixed fruits just in; good stock all round. A few blackberries coming in and arriving in good condition. One jobber reports having bought 60,000 boxes, as follows: 30 cars of B. C. No. 1, and offering to the trade at $1.60 per box, f.o.b. point of shipment; also 6 cars of B. C. No. 3, offering to the trade at 95c per box f.o.b. point of shipment; 60 cars of choice winters, Wenatchee, offering to the trade at $1 per box f.o.b. shipping point; 10 carloads of Spokane fancy wrapped, offering the trade $1.30 per box f.o.b. Spokane; also 20 cars choice winters from Milton, Oregon, quoting the trade f.o.b. Milton station, Oregon, $1 per box. Duty and freight to be added from American shipping point, and freight from British Columbia to purchaser's point.

The following are Washington prices to jobbers here at this date, f.o.b. point of shipment:

Pears	$ 1.00	$ 1.25
Prunes, peach boxes	.50	.55
Prunes, 4-basket crate	.60	.65
Fall Apples, per box	.75	.85
Peaches, per box	.40	.45
Tomatoes, per box		.30
Wash. Apples, choice grades	.85	1.00
Nova Scotia Grav. and other Fall varieties, per barrel	1.60	2.00
Winter varieties, f.o.b. shipping point, per barrel	2.25	2.50
Ontario Winters, offered according to variety per barrel	2.75	3.25
Montana Crabs, f.o.b. shipping point	1.10	1.25
B. C. prices, f.o.b. shipping point, Winter Apples, per box	1.25	1.50
Fall Apples	1.15	1.35
Prunes	.70	.80
Pears	1.50	1.75
Crabs	1.40	1.75
Potatoes, per ton	17.00	18.00
Carrots, per ton	15.00	17.00
Beets, per ton	15.00	17.00
Parsnips, per ton	18.00	20.00
Onions, per ton	26.00	28.00

The following are jobbers' prices to retailers this date:

Ontario Grapes, Concord, baskets		$0.38
Italian Prunes, Washington, peach boxes		1.10
Italian Prunes, Washington, 4-basket crate		1.25
Peaches, Wash., per box		.95
Pears, Wash., per box, Bartletts		2.25
Crabs, Wash, per box		2.15
Apples, different varieties	$1.75	2.25
Green Tomatoes, 40 lb. box		1.25
Ripe Tomatoes, peach box		.75
Ripe Tomatoes, 4-basket crate		.75
Culls, per doz.		.40

General condition of market on all lines of fruit is good. Supply of all lines heavy. Shipments of peaches about over. Prunes just starting in. Present conditions point to a very heavy trade in all lines of fruit during the balance of the year. Prices quoted on Italian prunes from American side somewhat lower. It was hardly anticipated from short crop.

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